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THE IRON TRADE REVIEW

Published Weekly
VOL. LXVI. NO. 16

CLEVELAND, APRIL 15, 1920

Entered as second-class matter at the post-office in Cleveland, Ohio, under the act of March 3, 1879

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Advertisers' Index, pages 246, 247
Engineering Directory, pages 200, 201, 202
Contents, 1100 (Editorial)
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Classified Advertisements, pages 214-245

The Story of a Connersville Rotary Pump Installation

FOREWORD

In response to a demand for more efficient pumping facilities in the rice irrigation districts of Louisiana and Texas, the Connersville Blower Company installed four 39" x 52" Cycloidal Pumps. This was in 1902.

In 1908, two more pumps of the same size were added, giving the installation a total capacity of over 300,000,000 gallons per day.

Chapter I

On August 11, 1915, thirteen years after their installation, W. B. Gregory, Professor of Experimental Engineering of Tulane University of Louisiana, and W. Trinks, Professor of Mechanical Engineering of Carnegie Institute of Technology, tested two of these pumps for the purpose of determining their mechanical efficiency.

Chapter II

The following results were obtained:—Volumetric efficiency more than 99%, which means that *slip is less than one percent.*

Mechanical efficiency of pump approximately 94%, which means that friction losses in gears, bearings, glands and water are about six percent of input.

Chapter III

In a letter addressed to the Connersville Blower Company these eminent engineers made the following statement:

"Both results are truly remarkable in view of the facts that the pumps have been in operation every summer since their original installation in 1902, and that, according to the statement of Mr. Brookshire, chief engineer of the Neches Canal Co.'s Plant, no major adjustments have been made".

Conclusion

Connersville Rotary Pumps are so designed and constructed that they will run for years with very little depreciation in efficiency and with practically no repairs.

NOTE

Copy of the report and letter written by Professors Gregory and Trinks, as well as a copy of the bulletin issued by the American Society of Mechanical Engineers, discussing this Rotary Pump Test, will be mailed upon request.

The Connersville Blower Company

Connersville Indiana U.S.A.

Chicago, Monadnock Block **New York, 114 Liberty Street**

THE IRON TRADE REVIEW

Vol. LXVI Cleveland, April 15, 1920 *No. 16*

Steel Industry Almost Paralyzed

Cutting Off of Fuel Supplies By Switchmen's Strike Forces Many Plants to Suspend and Number is Rapidly Increasing—Approximately 55 Blast Furnaces Banked—Virtually All Shipments Stopped—Market is Suspended

DEMORALIZED to a degree far beyond that brought about during either the steel and coal strikes of last fall, iron and steel operations virtually have been paralyzed by the first few days of the nationwide strike of railway switchmen. No such threat of complete stagnation has been faced by the manufacturers in many years, if ever. Coming as a climax to the prolonged period of car and fuel shortages, the strike has caught the industry in a highly vulnerable position with raw material stocks at a low point and plant yards congested with unshipped product. Scarcely a ton of freight now is moving in and out of works yards, many mills and furnaces have been forced to suspend and others will follow quickly as supplies on hand are worked up or the limited storage space remaining is filled with finished tonnage. The loss of production promises to be large and constitutes a new factor that must be reckoned with in future market conditions. Practically all producers have withdrawn as sellers and for the moment it may be said no iron and steel market exists.

How severe and sweeping the stagnation of production has been is to be read in the present state of blast furnace operations. A careful canvass of various producing districts by THE IRON TRADE REVIEW shows by the latest reports that no less than 55 blast furnaces have been forced to bank during the past three or four days, because of the stoppage of the flow of raw materials, particularly coke. These plants have a combined daily capacity of 20,000 tons or more or about 15 to 20 per cent of the current output. Many other stacks are on the verge of suspending and each day the strike is prolonged promises to swell the idle list. The Mahoning valley with 18, the Shenango valley with 12 and the Chicago district with 10 furnaces banked are the most affected spots.

Compete For Tonnage

An interesting price development is the report that one of the large independent companies has offered tonnage to agricultural implement manufacturers for delivery dating from July 1 at the minimum Steel corporation level. This represents 2.35c, Pittsburgh, on steel bars. This producer has been quoting around 3.00c to 3.25c to the general trade. It also is understood several of the independent producers are making a vigorous attempt to win some of the requirements of the large automobile interests dating from July which for the present year were supplied in the main by Steel corporation mills. This suggests that the prices adhered to by the leading maker again are more of a competitive factor. A report that the American Sheet & Tin Plate Co. proposed to charge more for open-hearth sheets and tin plate than for bessemer is denied officially. This interest starting this week is selling for last half at the March 21, 1919, schedule and is alloting its tonnage. At Chicago a large independent is about to announce bar, shape and plate prices for last half.

Iron Selling Suspended

With shipments by the furnaces practically suspended and an embargo against the south, pig iron selling has ceased temporarily. Consumption appears not likely to be curtailed in an equal degree for a time however. Many of the foundries have sufficient supplies of iron and other raw materials to run them for a week or two and deliveries of castings by truck will take care of a considerable portion of current output. This especially applies to automobile foundries in the Middle West. The key to such operations is the supply of coke. Negotiations for about 30,000 tons of basic are pending at Pittsburgh and Cleveland and $43 is the price generally named.

Export Trade Expanding

Export business which has been expanding again in recent weeks, is being held back by current strike conditions. A large amount of inquiry from all parts of the world is filling the market. Scotland has appeared as a buyer of pig iron for the first time since before the war. England has offered 4.25c, Pittsburgh, for 4000 tons of plates. American semifinished material is being sought actively by that country and inquiries for 5000 and 24,000 tons of billets respectively have been sent over. Europe is inquiring for 15,000 to 20,000 tons of bessemer pig iron. The demand from the Far East is very heavy.

APRIL 15, 1920

THE IRON TRADE REVIEW

A weekly publication devoted to the Iron, Steel, Foundry and Metal-working Industries

Published Every Thursday by
THE PENTON PUBLISHING CO., Cleveland

BRANCH OFFICES

CHICAGO - - - - - - - - - - 1147 Peoples Gas Bldg.
CINCINNATI - - - - - - - 501-505 Commercial Tribune Bldg.
NEW YORK - - - - - - - - 2203-2206 No. 220 Broadway
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BIRMINGHAM, ENG. - - - - - - - - Prince's Chambers
LONDON, ENG. - - - - - - - - 16 Regent St., S. W. 1.

Cable Address, IROTRAPEN, London

Subscription, United States, Cuba and Mexico, $5 per year. Canada $7.50 and other Foreign Countries, $10 per year.

Entered at the Postoffice at Cleveland as Second Class Matter

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Member, the Audit Bureau of Circulation and Associated Business Papers, Inc.

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Another Bill Against Radicalism

FOR the third time in little more than six months the iron and steel industry is threatened with a heavy loss of production because of strikes. Unless the present walkout of railroad switchmen is ended within the next few days, it is declared that the present trouble will exceed in the severity of its effects even the steel and coal strikes of last September and November respectively. Already not less than 50 to 55 blast furnaces in the country have been forced to bank and a large number of those now active scarcely will be able to survive a week or more of a shutting off of fuel and other raw supplies such as exists at the present time. Steel works and rolling mills, while their operations have been curtailed and in some cases most severely, are not likely to feel the full paralysis growing out of the situation for a time. However, if the present strike is protracted in any considerable degree the slump of steel production and finishing operations will be on an accelerated scale.

However quickly the strike may be brought to a conclusion it is certain that another large bill of lost production must be charged to the account of radical labor disturbances and to attempted methods of force. What this finally will amount to is uncertain at present but each day will add to the total at an appalling rate. Loss of iron and steel production in the steel strike alone was not less than 2,000,000 tons. It recently was estimated that the country was deprived of 20 per cent of its annual sheet output or about 500,000 tons as a result of the steel and coal strikes combined. The blast furnaces now banked have a combined capacity of not less than 20,000 to 25,000 tons of pig iron daily. It is exceedingly unfortunate that this latest flareup of radical and dictatorial spirit by a faction of unionism should come at this time since the iron and steel industry had just reached the stage where production was acquiring a large momentum and high records either were being established or were in near prospect.

The extensive loss of iron and steel production at this time is a calamity. Moreover, in view of the widespread shortage of material for useful and essential undertakings which are designed to fill pressing wants and therefore in the end would tend to reduce common values, it is an economic crime. Steel being a basic commodity, the effect on prices of any considerable interruption of production must be far-reaching. Nothing so clearly shows the damage the public must sustain from the resort to brute tactics in labor disputes such as a general strike represents. The country has been deeply stirred by this latest example of outlawry unleashed by the radical element of organized labor. It is in no temper to brook any prolongation of this new disaster.

Exempt the American Ships

ADMIRAL W. S. BENSON, chairman of the shipping board, is to be commended for his wise action in calling a conference at Washington the present week of business interests to discuss a merchant marine policy. Undoubtedly various suggestions that will be helpful in the solution of this question will be brought forth.

It may not come before the conference but nevertheless because of its vital importance to the establishment of a privately owned and operated American merchant fleet, it is hoped consideration will be given to the matter of exempting American coastwise vessels from payment of Panama canal tolls. Probably it is too much to hope that the present administration would face about and favor such an exemption after having forced through congress the infamous act compelling American ships to pay tolls the same as vessels under foreign flags. But this administration will not remain in office much longer and it might be well to prepare for legislation exempting American ships ready for favorable disposition, it is to be hoped, under the next regime at Washington. Chairman Wesley L. Jones of the senate committee on commerce only recently introduced a bill for this purpose.

At the outset of Panama canal traffic such exemp-

tion was granted American coastwise shipping and the democratic convention itself at Baltimore in 1912 endorsed the policy. Mr. Wilson approved of it in his speech of acceptance, and this undoubtedly gained for him many votes. Soon after he took office, however, he insisted very vigorously for the repeal of the law and was successful in this effort. To this day the President has not made clear his mystifying claim, which, in substance, was that the United States would alienate the friendship of other nations, with perhaps serious consequences, unless the law was repealed. It is not conceivable there existed such a probability, but if there were, then it is equivalent to proving that congress in repealing the law was forced to throw aside self-respect and national rights.

America owns the Panama canal. That certainly gives her the right to pass her own ships through the waterway free and to charge other vessels for a valuable privilege. Sooner or later there must be a return to that policy. At present, according to Governor Harding, the number of American ships now passing through the canal exceeds by one-third those of any other nation.

The forthcoming conference may not touch upon this question, but it well could do so with profit.

Keeping Up the Vicious Circle

RESTRICTION of output by labor organizations is one of the greatest factors in the present high level of prices. This restriction is not only a result of the shortening of the workday and the multiplying of men on the job, but also is a result of the constant strikes and walkouts.

With the country hungry for all forms of manufactured articles and raw material as a result of the war demand extending over several years past, production is far under normal in most lines as a result of unrest and lack of effort on the part of workers. The average worker has a false viewpoint on this situation, exactly opposite from the truth. He seems to feel that if he divides his job with another worker, but gets full pay for his half-work they both profit by the act. But he does not consider that he and his fellow worker are consumers also, buying what has been produced by like workers in other lines. With a double wage bill to pay for the normal production of one man the price on the things the workman needs likewise is increased to that extent or more As things have worked out, the increase in price more often than not has included other additions commensurate with that in the wage item. Consequently the workman himself actually is obliged to pay out in a larger proportion than he receives. If the average workman would speed up and produce twice as much as formerly he would find that what he buys would cost him on a correspondingly decreasing scale. By his present attitude he simply is defrauding himself as well as his employer and the public.

Chicago carpenters recently refused to allow the erection of portable or ready-made houses in that city to relieve the housing situation and help the high rent evil. Yet this refusal hurts the carpenter as much as any other renter by keeping high his own charges up in the air. The carpenters seek to restrict building to that done by union workers.

Checking Foreign Competition

ADMIRAL BENSON, chairman of the shipping board, has taken a decided stand in regard to the proposal to have American ships placed on the runs formerly occupied by the German steamship companies, and to permit the shore organizations of these ex-enemy concerns to act as agents for our ships. American steamship owners have voiced their opposition to such a scheme in public appeals to the shipping board. The American ship operators have not as yet announced any stand in the matter. One line alone among the American shipowners favors the plan, but that line is not a member of the American Steamship Owners' association, and its independence of action is proverbial in the shipping world.

The opponents of the plan have based their opposition almost exclusively upon their suspicion of German intentions, calling attention to the unfair methods of competition the ex-enemy shipping interests practiced in the days prior to the war. Admiral Benson, apparently, has no patience with those expressing such fears. To build up an American merchant marine service it not only is necessary to have agencies to handle the ships in foreign ports and to take care of the shipments and collect the freights; it is necessary that adequate docking space be procured and convenient piers obtained. The Germans own the best docks in many of the ports and in some it is almost impossible for another ship line to obtain convenient space for new piers.

In addition to this advantage is the fact that if American ships occupy the German runs they will be transporting to foreign markets German goods which are in competition with American goods from American ports. Through the control of transportation American interests would be put in the position of equalizing any advantage of production costs enjoyed by the German shipper. English shipping lines have enjoyed a similar advantage by reason of transporting competitors' freight to foreign customers as well as the freight of their own nationals. The arrangement has guaranteed the British an opportunity to protect and build up a tremendous export business, and a similar arrangement for this country on the German runs should benefit American foreign trade.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 1164 AND 1168

Pig Iron

Bessemer, valley	$42.00
Bessemer, Pittsburgh	43.10 to 43.40
Basic, valley	43.00
Basic, Buffalo	41.00 to 43.00
Basic, Pittsburgh	44.40
Basic, delivered, eastern Pa.	43.50 to 44.00
Malleable, valley	42.00 to 43.00
Malleable, Pittsburgh	43.40 to 44.40
Malleable, Chicago, furnace	43.50
Malleable, Buffalo, furnace	46.25
Malleable, delivered eastern Pa.	46.00 to 47.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$47.90 to 49.10
No. 1X, Buffalo	48.00
No. 1 foundry Chicago, furnace	45.25
No. 2 foundry, valley	43.00
No. 2 foundry, Pittsburgh	44.40 to 44.50
No. 2 foundry, Buffalo	45.00
No. 2 foundry, Buffalo, Boston del.	47.90 to 48.90
No. 2X, Buffalo, Boston del.	49.15 to 50.15
No. 2 foundry, Chicago furnace	43.00
No. 2 foundry, Ironton furnace	43.00 to 44.00
No. 2 foundry, Cleveland furnace	43.00
No. 2X, eastern, del., Phila.	46.80 to 47.35
No. 2X, eastern, N. J., tidewater	47.35 to 47.55
No. 2X, Pennsylvania, Boston del.	48.15 to 49.15
No. 2 foundry, Pa., Boston del.	46.90 to 47.90
No. 2X, foundry, Buffalo furnace	46.25
No. 2 foundry, del., Philadelphia	45.60 to 46.10
No. 2 foundry, N. J., tidewater	46.10 to 46.40
No. 2 southern, Birmingham	40.00 to 42.00
No. 2 southern, Cincinnati	43.60 to 45.60
No. 2 southern, Chicago	45.00 to 47.00
No. 2 southern, Phila.	45.50 to 47.50
No. 2 southern, Cleveland	45.00 to 47.00
No. 2 southern, Boston	50.00
No. 2 southern, St. Louis	44.30 to 47.35
No. 2X, Virginia, furnace	43.25 to 44.25
No. 2X, Virginia, Philadelphia	47.25 to 48.25
No. 2X, Virginia, Jersey City	47.65 to 48.65
No. 2X, Virginia, Boston	47.95
Gray forge, valley, Pittsburgh	42.40 to 43.40
Gray forge, eastern Pa.	43.00 to 43.50
Silveries, 8%, furnace	55.00
Ohio Silveries, 8%, Chicago	56.30
Tennessee Silveries, 8%, Chicago	56.30
Low phos. standard, Phila.	53.80
Low phos. Lebanon, furnace	47.00
Low phos. stan. valley del., Pitts.	50.40
Charcoal, Superior, base, Chicago	57.50

Coke

(At the ovens)

Connellsville furnace	$10.00 to 12.00
Connellsville foundry	10.00 to 12.00
Pocahontas furnace	12.00 to 13.00
Pocahontas foundry	12.00 to 13.00
New River foundry	12.00 to 14.00
New River furnace	12.00
Wise county furnace	11.00 to 11.50
Wise county foundry	12.00 to 12.50

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$200.00 to 250.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	195.00
Spiegel, 18 to 22 per cent furnace spot	62.00 to 65.00
Ferrosilicon, 50 per cent, spot and contract, delivered	85.00 to 87.50
Ferrotungsten, standard, per pound contained, furnace	85c to 1.00
Ferrochrome, 60 to 70 per cent chromium, 6 to 8 per cent carbon, per pound contained, maker's plant	17c to 19c
Ferrovanadium, 30 to 40 per cent per pound contained, according to analysis	6.25 to 7.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	62.50 to 64.50
Bessemer, ferrosilicon, 11 per cent	65.80 to 67.80
Bessemer, ferrosilicon, 12 per cent	69.10 to 71.10

Prices at Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	$65.00 to 75.00
Open-hearth, Youngstown	65.00 to 70.00
Open-hearth, Philadelphia	64.10 to 69.10
Bessemer, Pittsburgh	65.00 to 75.00
Bessemer, Youngstown	65.00 to 70.00
Forging, Pittsburgh	80.00 to 90.00
Forging, Philadelphia	79.10 to 84.10

SHEET BARS

Open-hearth, Pittsburgh	$70.00 to 80.00
Open-hearth, Youngstown	70.00 to 80.00
Bessemer, Pittsburgh	60.00 to 70.00
Bessemer, Youngstown	60.00 to 70.00

SLABS

Pittsburgh and Youngstown	65.00 to 70.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$70.00 to 75.00
Grooves skelp, Pittsburgh	3.25c to 4.00c
Sheared skelp, Pittsburgh	3.45c to 4.00c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.45c to 4.00c
Structural shapes, Philadelphia	2.70c to 4.25c
Structural shapes, New York	2.72c to 4.27c
Structural shapes, Chicago	2.72c to 3.72c
Tank plates, Pittsburgh	2.65c to 4.00c
Tank plates, Chicago	2.92c to 4.02c
Tank plates, Philadelphia	2.90c to 4.25c
Tank plates, New York	2.92c to 4.27c
Bars, soft steel, Pittsburgh	2.35c to 4.00c
Bars, soft steel, Chicago	2.62c to 3.52c
Bars, soft steel New York	2.62c to 4.27c
Bars, soft steel, Philadelphia	2.60c to 4.25c
Bar iron, common, Phila.	4.00c to 4.25c
Bar iron, common, Chicago	3.75c to 4.50c
Bar iron, common, Cleveland	3.75c
Bar iron, common, New York	4.02c to 4.27c
Bar iron, common, Pittsburgh	4.27c to 4.50c
Hard steel bars, Chicago	3.75c to 4.00c

Rails, Track Material

Standard bessemer rails, mill	$45.00 to 60.00
Standard open-hearth rails, mill	47.00 to 62.00
Relaying rails, light, St. Louis	52.00 to 55.00
Relaying rails, Pittsburgh	50.00 to 55.00
Angle bars, Pittsburgh base	3.00c to 4.00c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	2.45c to 3.25c
Spikes, railroad, Pittsburgh	4.00c to 4.25c
Track bolts, Pittsburgh	6.00c to 6.50c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 5c more)

Wire nails, Pittsburgh	$3.25 to 4.50
Plain wire, Pittsburgh	3.00 to 3.75
Galvanized wire, Pittsburgh	3.70 to 4.45
Barbed wire, painted, Pittsburgh	3.40 to 4.15
Barbed wire, galvanized, Pitts.	4.10 to 4.85
Polished staples, Pittsburgh	3.40 to 4.15
Galvanized staples, Pittsburgh	4.10 to 4.85
Cut nails, Pittsburgh, l. c. l.	6.19c
Coated nails per count keg, Pitts.	2.85 to 4.10c

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Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	6.25c
Sheet piling, base, Pittsburgh	2.55c to 3.65c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 8.50c to 10.00c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 9.00c
No. 28, bessemer, Pitts.	4.35c to 9.00c
No. 28, open-hearth, Chi.	4.62c to 8.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 9.00c
No. 28, bessemer, Pitts.	4.35c to 9.00c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c to 9.50c
No. 28, bessemer, Pitts.	5.70c to 9.50c
No. 28, open-hearth, Chi.	5.97c to 8.92c
No. 28, open-hearth, Philadelphia	10.00c to 10.50c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c to 7.00c
No. 10, bessemer, Pitts.	3.55c to 7.00c
No. 10, open-hearth, Chi.	3.82c to 6.77c
No. 10, open-hearth, Phila.	3.80c to 7.25c

Full sheet schedule page 1168.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00 to $8.75

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
⅜ to 3 in., butt steel	54 to 57½	40½ to 44
⅜ to 3 in., butt, iron	34½	18½

Full pipe schedule page 1168.

Boiler Tubes

Steel, 3½ to 4½ inches, c. l.	30½ to 40½
Iron, 3½ to 4½ inches, c. l.	11

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B

Four-inch, Chicago	$75.80 to 77.80
Six-inch and over, Chicago	72.80 to 74.80
Four-inch, New York	75.30
Six-inch and over, New York	72.30
Four-inch, Birmingham	69.00
Six-inch and over, Birmingham	66.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c to 6.00c
Bands, Pittsburgh	3.05c to 6.00c
Hot rolled strip steel, Pitts. stamping quality	5.50c to 7.00c
Cold finished steel bars, Pitts., base	4.10c to 6.50c

Rivets

Structural rivets, Pittsburgh	4.50c
Boiler rivets, Pittsburgh	4.60c
Rivets ⅞ in. and smaller, Pitts.	50 off

Nuts and Bolts

(Prices f.o.b. Pittsburgh)

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	40–5 off
Cut thread	30–10 off
Larger and longer	30 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	40–10–5 off
Cut thread	40–5 off
Larger and longer	30–10 off
Plow bolts Nos. 1, 2 and 3 heads	40 off
Other style heads	20% higher
Stove bolts in packages	70–10 off
Stove bolts in bulk	70–10–2½ off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	60–5 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	60–5 off
Gimlet and cone point lag screws	50 off

NUTS

Hot pressed, square blank	2.00c off
Hot pressed, square tapped	1.75c off
Hot pressed, hexagon blank	2.00c off
Hot pressed, hexagon tapped	1.75c off
Cold pressed, square tapped	1.75c off
Cold pressed, square blank	2.00c off
Cold pressed, hexagon blank	2.00c off
Cold pressed, hexagon tapped	1.75c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales, at the dates named

	Prices Apr. 14, 1920	Average prices March, 1920	Dec., 1919	April, 1919
Bessemer, valley, del., Pittsburgh	$43.40	$43.40	$36.65	$29.35
Basic, valley, delivered, Pittsburgh	44.00	44.40	35.40	27.15
*No. 2 Foundry, Val. del. Pittsburgh	44.40	43.40	38.15	28.15
*No. 2 Foundry, Chicago, furnace	43.00	43.00	37.50	26.75
Lake Superior charcoal, Chicago	57.50	57.50	42.00	33.25
Malleable, valley	43.00	43.75	36.60	28.65
Malleable, Chicago	43.50	43.50	38.00	27.25
*Southern, No. 2, Birmingham	40.00	40.00	35.15	28.00
*Southern Ohio, No. 2, Ironton	43.50	43.25	36.55	26.75
Basic, eastern del. eastern Pa.	43.75	43.00	35.75	29.65
**No. 2X, Virginia, furnace	43.25	43.25	38.25	28.45
**No. 2X, eastern del., Philadelphia	46.90	45.70	40.75	31.99
Gray forge, valley del., Pittsburgh	42.40	42.40	36.40	27.15
Ferromanganese, 80 per cent, delivered	200.00	168.00	120.00	127.50
Bessemer billets, Pittsburgh	70.00	65.00	45.00	38.50
Bessemer sheet bars, Pittsburgh	70.00	70.00	48.00	42.00
Open-hearth sheet bars, Pittsburgh	80.00	74.00	48.00	42.00
Open-hearth billets, Pittsburgh	70.00	67.00	45.00	38.50
Steel bars, Pittsburgh	3.75	3.85	2.90	2.35
Steel bars, Chicago	3.52	3.03	2.62	2.62
Iron bars, Philadelphia	4.25	4.20	3.375	2.595

	Prices Apr. 14, 1920	Average prices March, 1920	Dec., 1919	April, 1919
Iron bars, Cleveland	$3.75	$ 3.75	$ 3.25	$ 2.65
Iron bars, Chicago mill	3.75	3.50	2.82	2.58
Beams, Chicago	3.72	3.16	2.72	2.72
Beams, Pittsburgh	3.25	3.25	2.45	2.45
Beams, Philadelphia	4.25	4.00	2.745	2.695
Tank plates, Pittsburgh	3.75	3.75	2.65	2.65
Tank plates, Chicago	4.02	3.38	2.92	2.92
Tank plates, Philadelphia	4.25	4.25	3.125	2.895
Sheets, blk., No. 28, Pittsburgh	6.00	6.00	4.35	4.35
Sheets, blue anld., No. 10 Pittsburgh	4.85	5.35	3.55	3.55
Sheets, galv., No. 28, Pittsburgh	7.50	7.30	5.70	5.70
Wire nails, Pittsburgh	4.00	4.00	3.95	3.25
Connellsville furnace coke	12.00	6.80	6.25	3.80
Connellsville foundry coke	12.00	7.60	7.15	4.55
Heavy melting steel, Pittsburgh	26.50	27.90	24.60	15.75
Heavy melting steel, eastern Pa.	24.25	25.60	22.85	15.85
Heavy melting steel, Chicago	23.50	24.30	21.25	16.40
No. 1 wrought, eastern Pennsylvania	35.50	36.50	30.75	21.50
No. 1 wrought, Chicago	30.25	30.00	27.00	18.50
Rerolling rails, Chicago	32.50	32.60	31.50	17.95

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Pig Iron Market is Suspended

Almost Complete Stagnation of Shipments Because of Strike Causes Buyers and Sellers to Withhold Action—Much Iron Being Piled by Furnaces and Consumers Forced to Rely Wholly on Stocks—Basic Negotiations Active

Philadelphia, April 13.—Eastern pig iron production is demoralized because of the railroad strike. Embargoes have cut off fuel and most shipping destinations so that most of the furnaces have no alternative but to bank. The Alan Wood Iron & Steel Co. has banked two stacks. Oxford and one Warwick furnaces also are banked. Many others must follow in a few days even if railroad situation is improved as the fuel consumption of most furnaces has been from hand to mouth and stocks are depleted. The effect will be lost production and diminishing stocks at consuming plants. Although furnaces in view of the strike are less willing to sell now, considerable business was done the past week, the Westinghouse Electric & Mfg. Co. closed its inquiry for foundry iron at full market prices and some other good sized lots were placed. Eastern Pennsylvania foundry is based on $45, furnace, for No. 2 (1.75 to 2.25 silicon) plain and only shading from this price is to absorb freight rate disadvantages. Virginia iron generally is held at $43, base, excepting some stock iron at $42, base. Virginia offerings have been slightly larger the past week for the second half but the whole Virginia situation now is dominated by embargoes preventing shipments west and north of Hagerstown. As a result there may be some banking of Virginia furnaces. In central Pennsylvania the minimum generally is $44, base, although it might still be possible to do $43. As a result sizable business done the past week, basic now is higher at $43.50 to $44, delivered eastern Pennsylvania. The Reading Iron Co., the requirements of which have grown because recent plant acquisitions is negotiating for 15,000 to 20,000 tons of gray forge for third quarter. Gray forge makers in some cases have a minimum asking price of $44, eastern Pennsylvania furnace, but probably lower could be done. This grade is scarce. Several thousand tons of copper-bearing low phosphorus have been sold at $47, furnace. Small tonnages of standard iron have been sold at $50, eastern furnace. Europe is inquiring for 15,000 to 20,000 tons of bessemer mostly for Italy. No malleable has been sold but eastern Pennsylvania makers are expected to quote on 4500 tons of malleable for the remainder of the year which a Canadian consumer cannot get from regular sources.

Market Without Feature

Chicago, April 13.—Both trading and transportation are severely interrupted and pig iron is in the quietest condition it has been for many years. The strike of yardmen effectively has tied up all transportation of pig iron except from the Duluth stack, and on certain routes out of Mayville, Wis. All merchant stacks in the immediate Chicago district are producing, their supplies of coke not having been cut off entirely, but they are unable to load and ship and as a result are piling iron for future shipment. Melters are not much worried, or at least are not making their troubles known to furnaces, and appear to be making the best of conditions by using what iron they have on hand. Southern iron appears to be be receding somewhat from its high mark, and $40, Birmingham, was done recently on a sale of 500 tons of foundry iron for last half several southern producers quoting this figure.

Inquiries Better Than Sales

Pittsburgh, April 13.—Inquiries for pig iron in this market continue to exceed the actual amount of tonnage being closed. Tonnages of basic iron aggregating at least 20,000 tons are before makers but negotiations are progressing much slower than ordinarily is the case. All of this tonnage is for delivery over the next 90 days and includes 10,000 tons for the American Rolling Mill Co., Middletown, O., and from 5000 to 6000 tons for the East St. Louis plant of the National Enameling and Stamping Co. It had been expected that the latter tonnage would be closed by this time and it is believed that it will be closed shortly at $43, furnace, the iron to come from a valley furnace. It is understood that the American Rolling Mill Co. is offering a premium of $2.50 per ton for iron of lower than standard sulphur content. The Monongahela Steel & Iron Co., Paden City, W. Va., is in the market for 1500 tons of bessemer for third quarter, but it is understood to be getting no offers. The only sizable sales of this grade of iron which has recently taken place has been 400 tons for early delivery at $42.50, valley. Recent sales of foundry iron also have been small and prices show considerable variance. While small tonnages are reported to have been sold for prompt delivery at $45 for No. 2 (1.75 to 2.25 silicon) a Johnstown radiator company claims to have covered its inquiry for 1500 tons recently put out, at less than $43, delivered. Just where this tonnage came from is not known but it is believed to be a portion of a tonnage piled on the yards of a Buffalo steel company which from time to time makes foundry grades. A sale of 500 tons of foundry iron said to be No. 2 grade at $40.50 western Pennsylvania furnace is reported. A stronger mar-

ket temporarily is looked for in iron following the settlement of the railroad situation due to the fact that shipments entirely are suspended and to the expectation that such supplies as consumers have on their yards will be used up before the latter suspend.

All Shipments Shut Off

Cleveland, April 13.—Conditions are at a standstill in the pig iron market in Cleveland and vicinity due to the switchmen's strike. None of the merchant furnaces in this territory have been forced to bank but no shipments now are possible and current production is being piled on the yards. In one case in northern Ohio one furnace used its own switching crews to bring in cars of coke which were nearby when the strike shut off all regular traffic. The furnaces are in different positions with respect to fuel supplies. Some of them will scarcely be able to last the week out while others especially those with by-product coke plants in connection are in a relatively safe position. Up to the time of the development of the strike the market had shown a moderately increased activity both in sales and inquiry. One interest sold 3500 tons mainly for last half on the basis of $43 furnace for No. 2 (1.75 to 2.25 silicon). This included 1500 tons of high silicon iron to an automobile builder. Several hundred tons of prompt iron also were sold by this maker at $44 base. Another interest booked several thousand tons additional including 1500 tons of No. 2X for last half at $44.25 valley. Offers of small lots of prompt foundry iron at $42 valley at which some sales recently were made, no longer are available. The lowest price for such iron some middlemen now are able to make are at $45.35 Cleveland or equivalent to $43.95 valley. A number of negotiations for basic are under way. These include 10,000 tons for a southern Ohio steel maker for second quarter, 7500 tons for a Mahoning valley consumer for last half and 5000 tons for a northern Ohio user for April-June shipment. Where the furnaces have been willing to name a price $43 furnace has been quoted. Sales of 500 to 600 tons of silveries at $55 Ohio furnace for 8 per cent are noted and the market now is quoted uniformly on that basis. The American Brake Shoe & Foundry Co. is inquiring for 3000 tons of low phosphorus foundry iron for third quarter delivery at Newark, N. J.

New England Embarrassed

Boston, April 12.—The pig iron situation in New England has suddenly become as tight as any time during the severe weather of a month ago. Foundries had not been able to get ahead during the few weeks of comparatively normal shipping conditions and the new strike situation with its resultant embargoes on New England roads is causing serious embarrassment. One foundry is reported as already closed down and many others are known to be operating on less than 10 days supply. So completely is the transportation tied up that there is practically no spot iron available. Dealers are devoting most of their attention to getting deliveries and the last half market as a result has been quiet. In general the market which appeared firmer last week is now irregular and spotty. The Thomas Iron Co., Easton, Pa., has advanced its price to a $46 base and several thousand tons at this figure have been placed. On the other hand, concessions in the Buffalo district are reported. One moderate sized sale of No. 2X Buffalo (2.25 to 2.75 silicon) was made to a Massachusetts consumer at $45 furnace or $48.90 delivered. Another sale of 300 tons of No. 2 foundry (1.75 to 2.25 silicon) was made at $44 furnace or $47.90 delivered. An Ohio maker has been quoting New England foundries $47.70 delivered for No. 2X iron which is at least $1 below any other price reported in this territory. In Virginia sales have been made at $42 base, though available iron at this figure rapidly is decreasing. One Virginia maker is reported as making several sales at concessions below the $42 base. Sales of Virginia Iron, Coal & Coke Co., Roanoke, Va., iron have been on a $43 base or $47.70 delivered for 1.75 to 2.25 silicon iron, although that interest nominally is out of the market. Several sales aggregating approximately 1000 tons of Alabama iron have been reported. These for the most part have been at $42 base or $50 delivered. An inquiry from a Bridgeport, Conn., consumer is for 3000 tons for last half. Another Connecticut consumer wants 2000 tons but there seems to be no urgency behind the request for prices.

Buying Continues Satisfactory

New York, April 12.—Pig iron buying continues of fair proportions here and new inquiries are out in increased volume. Among them is one large block of basic for third quarter and several large tonnages of foundry iron for delivery over the rest of the year. Sales of the past week included several lots for export, one of them involving 1000 tons of southern foundry at the current market for Italy. A lot of 500 tons of bessemer was sold for shipment to another European destination. On the whole, pig iron demand from Europe now is of a more promising character than for sometime past. Prices on foundry iron continues about the same as they were a week ago. Among Virginia furnaces the $43 base price has been done on fair quantities of foundry, both for first half and last half, and one maker which previously had been selling only for first half, now is taking on second half at the $43 price. At the same time, the $42 base price has not yet entirely disappeared. One furnace asking $43 for iron which has not yet been made, for instance, has sold some tonnage off its stockpile during the past week at $42 base. In eastern Pennsylvania the minimum with most makers continues $45, furnace, for 1.75 to 2.25 silicon, and $46 to $46.25 for 2.25 to 2.75 silicon, but some eastern Pennsylvania foundry still may be had at around 50 to 75 cents a ton below these prices, although the concessions are obtainable largely in consideration of freight rate disadvantages.

More Sales at $45

Buffalo, April 13.—Less than 2000 tons of iron, it is estimated, was sold in this district during the past week. Furnaces apparently have been able to absorb all the needs of the foundries and among these the larger consumers are well covered for the balance of their needs this year. All of the iron sold was foundry grade at a $45 base price. Most of it was for delivery over the first half though a small lot of a couple of hundred tons which a needy consumer asked for, was made for prompt delivery. This iron was No. 2X and was sold for $46.25. The only trace of iron sold in this district last week at less than $45 base for 1.75 to 2.25 silicon was some resale iron which was offered at between $42 and $44. One interest sold 1000 tons of foundry in the aggregate which was the largest booking by any one producer. Another furnace took 400 tons. Prior to the strike of the switchmen the furnaces here were making extraordinarily good shipments. The Rogers-Brown Iron Co. had just blown in its fourth furnace, placing the entire group at Lackawanna, N. Y. in action. The inquiry reported by one furnace as an aggregate figure on foundry during the week was between 6000 and 7500 tons. Another inquiry for basic was reported. This amounted to 10,000 tons and was not placed. It is understood that two other basic inquiries—the last two to be reported as having been received in this district—were withdrawn to await a better price. The quotation given on these former inquiries was $45.

No Basic to Offer

Youngstown O., April 13.—A valley steel interest which recently sold a few thousand tons of basic below the general market has withdrawn and will offer no further tonnages until the supply of coke becomes more plentiful. Some off-grade basic which is being held at $42, valley furnace, has been refused by consumers at this price. A consumer of basic in this district now is in the market for between 5000 and 7500 tons.

Furnaces Near Banking

Cincinnati, April 12.—So far no blast furnaces in this district have been forced to bank on account of the railroad tieup, but it is expected that a number if not all will have to go out within the next few hours or within a day or two at the most. Even if the strike were to be settled in the near future some of the furnaces would be forced to bank because of the exhaustion of raw material and coke supplies. The Hamilton Furnace Co. averted banking today by obtaining a few hours' supply of coke and expects to be able to keep going until Wednesday. It is hampered only by a shortage of coke, being well supplied with ore. The Andrews Steel Co. and the Newport Rolling Mills Co. are both close to the end of operations and the same condition is reported at the American Rolling Co. mills and the Marting Iron & Steel Co. furnaces. Some Ironton furnaces were reported today getting ready to bank tonight. Ashland furnaces expect to keep going for a day or two. The crying need is for coke, the movement of which has been hard hit by the strike.

The iron market has developed con-

siderable strength during the past week and the available supply is not so plentiful. Bookings for the second half in southern iron are said to be better than for the second quarter and there is good buying for the latter period. It is estimated that about 60 per cent of consumers in this district have provided for their last half requirements. One southern furnace which has been offering No. 2 (1.75 to 2.25 silicon) at $42 Birmingham, has withdrawn and announced that orders booked either for prompt delivery will be at $43 to $44. There is said to be some southern iron still in the market at $40 Birmingham, but the bulk of offerings are at the higher range of prices. Northern iron is firmer. Producers and distributors say there is no more $41 iron and that sales are being made at $43 to $44 furnace base.

Flurry in Small Lots

St. Louis, April 10.—Small lots of pig iron, ranging from 100 to 500 tons, were in demand during the past week, and sales bulked fairly large. Dealers are at a loss to explain the flurry, but many believe it is due to users having underestimated requirements. The price factor also may be an incentive. Certain melters fear the recent advance in coke may result later in a corresponding increase in iron quotations. From what can be learned, however, there is not likely to be further addition to the price of iron. Most of iron sold in the week has been of northern and eastern manufacture. Generally the $42 base price for 1.75 to 2.25 silicon has prevailed, but there have been numerous inquiries for $40 iron, and many users are unwilling to pay more than the latter figure. Birmingham furnace interests are holding out for $42 base and have considerable tonnages to offer at that price. Production in the south is heavy, and it is believed there has been some accumulating in producers' yards. Shipments have been coming along in fairly good time.

South Selling Small Tonnages

Birmingham, Ala., April 13.—Small tonnages of pig iron are being sold for delivery in the last half of the year. The Tennessee Coal, Iron & Railroad Co., continues to quote No. 2 foundry (1.75 to 2.25 silicon) at $38, while other companies are asking $40 to $42 and are able to dispose of their product. One of the active companies holding to the higher prices announces having sold 60,000 tons of iron in the last 60 days, with inquiries still coming in. Shipments of pig iron are delayed by reason of car shortage and embargoes. A considerable tonnage was started the latter part of the week to the Cincinnati and Chicago districts. The Alabama Co. soon will blow in its Gadsden furnace, which has been repaired, and two other stacks are almost ready to be lighted and should be making iron the latter part of the month. Sales during the past week were made to consumers in various parts of the country. Southern melters took on some of the tonnage. It is estimated that one-third the probable make of the last half has been sold by furnace companies of Alabama.

Coke Movement Tied Up

Practically All Rail Outlets from Connellsville Region Closed—Mahoning and Shenango Valley Furnaces Most Seriously Affected

Pittsburgh, April 13.—Practically all avenues of outlet for coke from the Connellsville regions are closed as a result of the strike of the railroad yardmen. Although some blast furnace interests received supplies up to Monday, and the Southwest branch yards of the Pennsylvania railroad were still operating, making possible shipments as far east as Altoona, not a car has moved on other routes in the past 48 hours. While a large number of stacks have been banked as a consequence of the suspension of fuel shipments, quite as many are still in blast, and if the transportation tieup is not of long duration the latter will remain in continuous operation. Thus far the effect of the suspension has been most severe in the Mahoning and Shenango valley districts. All of the steelworks furnaces in these districts are banked, while five merchant blast furnaces have turned off the blast. None of the Pittsburgh district stacks yet has been forced down. Few of the active stacks, however, have more than a week's supply of coke on hand and banking will be necessary unless there is an early restoration of rail service. A good deal of coke appears available. Up to the time of freight suspension, spot tonnages of both foundry and furnace beehive coke were being moved at $12, generally, with some business on either side of that figure. Considerable tonnage of furnace coke for last half is under negotiation. It is reported that a contract for 10,000 tons a month has been closed for that period at $10 ovens, while another is said to be practically closed on a sliding scale basis, calling for a minimum of $5.25 on $25 valley basic pig iron and a maximum of $10 for coke on $44 valley basic pig iron. This latter deal, if concluded, would figure out a ratio of 4½ to 1 on valley basic pig iron. On last half foundry contracts, $10, ovens, appears to be the minimum with operators. Connellsville production of coke for the week ended April 3, is estimated by *The Connellsville Courier* to have been 248,005 tons, against 254,552 tons in the previous week.

Seaboard Advances Prices

New York, April 12.—Owing to the railroad situation, very little coke now is being moved. The Seaboard By-Products Coke Co. has notified customers that it proposes to make an advance of $1 in its price to become effective tomorrow night. This interest has been making second half contracts, involving the same tonnages as existed on first half contracts, with regular customers, at $10 Connellsville. It is securing $12 on all excess tonnage and on new business. Effective Wednesday morning, the Seaboard interest's prices will be $11 and $12, Connellsville, respectively. Both New England by-product makers are out of the market on spot foundry coke, but the New England Coal & Coke Co. continues to book second half business at $13, Connellsville. Fair tonnages of spot beehive foundry coke are being booked at $11 to $12, Connellsville, and in some cases, higher is being done. Beehive makers have about finished taking second half contracts for foundry coke.

New England Buying Droops

Boston, April 12.—With the advance in price of foundry coke to $15.40, delivered to New England consumers, the buying movement has noticeably dropped off. Undoubtedly a large percent of the year's requirements in foundry coke has already been contracted for and additional business will be nearly all small lots for filling in. The Providence Gas Co. has announced a price of $11, Connellsville, as governing its sliding scale contracts for April. The Seaboard Coke Co., Jersey City, is offering foundry coke in New England at a $10 base price to old customers to the limit of tonnage previously contracted. For new customers and increased tonnage for old customers this company's price is on a $12 base or $16.40 delivered to New England.

Market Is Unsettled

Cincinnati, April 12.—The coke market in this district is unsettled and more particularly because of the interruption of deliveries by the railroad strike. Shipments of coal are being abridged and while practically all ovens are resuming near capacity this production necessarily will have to be curtailed and in many instances entirely suspended in a short time unless the railroad situation is relieved. In any circumstances a number of coke plants will have to shut down. Prices on the whole are unsettled and irregular. Contracts for a considerable tonnage of Connellsville foundry coke has been renewed at $10, ovens. There is a reported scarcity of Pocahontas furnace and foundry coke. There has been good buying of New River foundry coke recently, and one distributor has booked at $12.50 ovens.

Second Half Coke at $11 to $12

St. Louis, April 10.—Contracting for coke for last half delivery has subsided to some extent. Some business was done in the past week, however, aggregating about 4000 tons, at from $11 to $12 ovens, for the 72-hour Connellsville grade. Spot coke and second quarter requirements continue urgent, the demand being well ahead of available supplies, and prices very strong. Some sales have been made as high as $14. Sentiment among consumers and the better class of dealers is strongly against further advances in price.

Makers Unable to Ship

Philadelphia, April 13.—Spot furnace coke is bringing around $11, Connellsville, and some second half contracting for foundry coke has been done at $12, Connellville. The whole coke situation has been changed, however, by the inability of makers to ship.

Bar Offers Withdrawn

Choking Off of Production Causes Contraction of Material On Market —Independent Seeks Implement Trade Tonnage at 2.35c

Chicago, April 13.—Present plans are for the leading independent producer of finished steel in the Chicago district to apportion its remaining last half tonnage of soft steel bars this week if possible. No decision has been made as to the price which will apply on this business, and it is possible it may be sold at the figure prevailing at the time of delivery. Various delays in production have carried over so much first half tonnage that comparatively little mill space remains for third quarter material, and most of the tonnage to be apportioned will be for the final period. The leading interest is not quoting higher than 2.62c, Chicago, on bars, but has nothing to sell.

Bar iron continues to be quoted at 3.75c, Chicago mill, and upward. The mills are picking their inquiries from the large number being offered, taking such specifications as are favor able to production. Railroads are inquiring for much material, and the East is seeking to place orders with local makers. Delivery is the deciding factor, the price not being regarded mainly.

Manufacturers of hard steel bars are quoting 3.75c, Chicago mill, and upward but price is no object to consumers of this product. Western mills are full for the next four or five months and are devoting their energies entirely to filling the needs of their regular trade. Outsiders are able to obtain tonnage only at the convenience of the mill.

Bookings Are Stopped

Philadelphia, April 13.—Several independent mills by reason of improved production and shipments lately took more steel bar business than usual the past week at prices ranging from 3.25c to 4.00c Pittsburgh. Due to railroad embargoes resulting from the strike they now have stopped booking as mills probably will close in a few days because of inability to ship product and receive materials. Eastern makers have made changes in bolt, nut and rivet prices. They are now quoting ⅜ by 4-inch and smaller bolts, rolled threads, 40 and 5 off against 40, 10 and 5 off formerly; and cut threads, small sizes, at 30 and 10 off or same as large sizes. Large bolts are unchanged. These prices are for bolts with hot-pressed nuts. Bolts with cold-punched nuts now are 25 off. Carriage bolts ⅜ by 6-inches and smaller with rolled threads which were 40 and 5 off now are 30 and 10 off. Small sizes with cut threads which were 40 and 5 off now are 30 and 10 off. Small sizes with cut threads now are 30 off where previously they were 30 and 10 off. Previously orders for less than 100 pieces of any size were taken at the regular discounts. Hereafter makers will give the regular discount but will add an extra of five per cent for 25 to 99 pieces of a size and 10 per cent for 10 to 24 pieces. Special prices will be made on less than 10 pieces one-half inch and larger. Railroad spikes are unchanged at 4.25c base but ⅞ and ⅝-inch now are 5.50c or ½ cent higher. Boat spikes in small lots are at 6.00c base and at 5.50c base for 25 kegs or more.

An inquiry for 1500 to 1600 tons of reinforcing bars for a job at Harrisburg, Pa., is current in this district, and it is reported an eastern mill has quoted a low price, Pittsburgh, on this business.

Shipments and Production Down

Pittsburgh, April 13.—Both shipments and production of steel bars have been shortly curtailed by the transportation tieup. The leading independent here continues in operation but three plants of the Carnegie Steel Co. in this city at which bars are rolled are affected by the interruption of steel shipments from other plants. Demands under present conditions can get little if any attention, but a large number still are coming out, one company recently being obliged to turn down an attractive order because of the railroad situation and the fact that it had withdrawn from the market. This inquiry was for 5000 tons of small rounds. It is understood that some of the independent makers of bars are naming the March 21 prices to makers of agricultural implements.

Makers of iron bars are heavily committed and holding firmly to 4.50c, base, for common iron. Some additional business in iron bars has been placed by a Pittsburgh district consumer in the Middle West. Latest business of this sort carried the price of about 4.00c, Chicago, or 4.27c, Pittsburgh.

High Bids For Small Rounds

Pittsburgh, April 13.—As much as 9.50c, base, recently was offered for ½ and 9/16-inch cold-finished steel bars in rounds, but the business failed of acceptance as it involved quicker delivery than any of the makers could guarantee. No let-up is observed in the demand for prompt tonnages and those who can take on such business report no difficulty in making sales as high as 6.50c, base. This measures the maximum on any business that is reported here and prices range down to as low as 4.10c, at which price one large maker here is entering more or less business. Another large company is naming a base of 4.25c on such business as it finds itself in a position to accept. Marked falling away in production is likely if the transportation tie-up is of any considerable duration as makers of cold-finished steel bars largely are dependent upon current receipts of hot-rolled bars to meet their obligations, as they have not been able to accumulate any reserve supplies on account of the comparatively light shipments over a long period.

Only to Regular Trade

Chicago, April 13.—Manufacturers of bolts and nuts are taking no business from any but regular customers, and even these are able to buy only small lots for their most pressing needs.

Shipments Are Suspended

Pittsburgh, April 13.—While most makers of nuts, bolts and rivets in this district still are operating they are unable to make shipments on account of the railroad tieup and fears are expressed that unless the trouble is promptly settled, they will be obliged to curtail or suspend operations due to the lack of raw material. Makers are well booked through the third quarter and the completion of even

Price Tendency Still Upward

Pittsburgh, April 13.—Although the Carnegie Steel Co. continues to quote hoops and bands at a base of 3.05c, Pittsburgh, and to take some business at that figure, independent companies are having no trouble in obtaining 5.00c base, on such tonnages against which they can name a specific delivery, and some business is reported as high as 6.00c. One large maker now quoting 5.00c, base, is said to be considering an advance to 5.50c, base.

Some Sales

Of English and American Ferro Reported at $250—Spiegel Scarce

New York, April 12.—Some English 76 to 80 per cent ferromanganese has been sold for second half shipment to this country at $195, c.i.f. tidewater. Some outside English metal has been disposed of for spot delivery, at $250, delivered. The tonnages involved in both cases were small. No sizable business in domestic ferromanganese has characterized the market during the past week.

Spiegeleisen, while scarce, continues obtainable for spot shipment as well as for the future. Current asking prices range from $62 to $65, furnace, for 20 per cent.

Will Make Ferromanganese

Philadelphia, April 13.—Although spiegeleisen is difficult to obtain, a limited tonnage has been sold at $62 to $65, furnace. One maker is asking $75 on futures. Some standard ferromanganese for last half delivery was sold at $200, delivered. Some spot material sold at $250, delivered and some 74 to 76 per cent for April, May and June at $230, delivered. Some of the latter grade was sold for April delivery at $250. The Sheridan furnace is now on pig iron, but is expected to start on ferromanganese in May. The Reusens stack is making pig iron, but is expected to switch to ferromanganese in July. One Dunbar furnace is being relined and will go on ferromanganese.

Several good tonnages of high-grade Chinese, Indian and Brazilian manganese ore sold at 70 to 75 cents, tidewater.

Ferromanganese Firmly Held

Pittsburgh, April 13.—The situation in ferromanganese remains extremely firm in this district, both as regards prompt and deferred shipments. While no considerable amount of tonnage yet has changed hands here at $250, delivered, for early tonnages, that price

is as low as any of the makers now are naming, while on last half tonnages of domestic material $200, delivered, is the general quotation. Some fourth quarter English ferromanganese recently has been offered at around $175, c.i.f. Atlantic seaboard, but buyers have shown no disposition to take on such offerings as they seem to doubt the ability of English makers to make deliveries. On domestic material for prompt delivery for consumption in this district, $235 appears to be as high as any business has been done.

Prompt supplies of spiegeleisen also are small and makers have exceedingly firm price ideas, as they are committed against practically all of their production over the first half of this year. Inquiries for third and fourth quarter delivery are increasing on account of the extremely tight situation in ferromanganese. No improvement can be reported in the market for 50 per cent ferrosilicon and ferrochrome and ferrotungsten remain in extremely light demand. Although domestic ferrochrome is quoted up to 20 cents per pound competition for business is extremely sharp among domestic producers and less than 17 to 18 cents a pound recently has been named.

All Prices Higher

Chicago, April 13.—More activtity is noted in the market for spiegeleisen and prices are firm and tending downward at $60 to $65. On prompt ferromanganese $250 is known to have been done recently and $200 for last half is being held firmly. The silvery situation is difficult to probe, one Jackson county interest having withdrawn itis former price of $55, furnace, and others ot being in the market The Tennessee maker is also out of the market.

Settling Tie Prices

Pittsburgh, April 13.—Two quotations probably will prevail on cotton ties this season since the indications are that the Carnegie Steel Co. will open its books this year at slightly higher prices, while the attitude of independent makers is that they should get relatively as much for ties as they can obtain for hoops and bands. On the present base of hoops and bands, this would indicate a price of $2.25 to $2.50 per bundle of 45 pounds for cotton ties from independent mills, and a price by the Carnegie Steel Co. of $1.90 to $1.95 in lots of 3000 bundles or more. One Pittsburgh maker having a capacity of 300,000 bundles of cotton ties, has announced that he will not roll them this year unless orders are placed now and a price equivalent to at least 5.00c for hoops and bands can be obtained. Since a cotton crop of 12,000,000 bales is indicated this year, and tie production will be based on such a crop, a considerable shortage might result from the withdrawal of this company from the market. A 12,000,000-bale cotton crop would require 2,400,000 bundles of ties and allowing for 10 per cent which will be remade from old ties, such a crop would involve new production of 2,160,000 bundles.

Plate Output Cut Off

Eastern Mills Forced to Close by Breakdown of Movement of Material —Quick Congestion Feared—Important New Inquires Appear

Philadelphia, April 13.—Railroad embargoes are general as the result of the strike and plate mills unable to ship or receive materials. Because of this double reason some of the mills already have been forced to suspend. All mills of the Lukens Steel Co. are down but one, the plate mill of the Alan Wood Iron & Steel Co. is idle and all others are expected to stop within a week if the strike continues. Prior to this development in the railroad situation, an unusual rush of specifications against first quarter contracts just expired was directed to the plate mills and many new inquiries appeared including 20,000 tons of ship steel for one yard and similar material for other yards. A new Baltimore & Ohio inquiry for 5000 to 10,000 tons and a new Pennsylvania inquiry for several thousand tons as well as numerous others also were put out. The whole situation now hangs on railroad strike developments. Independent mills generally last quoted 4.00c Pittsburgh. During the past week the United Kingdom bought several lots of plates at 4.00c Pittsburgh for tank and 4.25c for ship quality. Italy took several tonnages at these prices. The Japanese demand has stopped following a reaction in the speculative market in that country due to overloading by some interests there. Plates out of stock in Japan are commanding less than $125 per net ton compared with $150 about three weeks ago.

Output Likely to Suffer

Pittsburgh, April 13.—The effect of the railroad tieup is likely to be more severe upon plates than on the lighter lines of finished steel, for while stocking of sheets, tin plate, wire and pipe is possible, the attempt of most makers is to run the former product direct from the mills onto the cars. This will not be possible if serious congestions at the mills is to be avoided and is hardly likely with the movement of cars largely tied up. Mills in this district still are running, but are likely to be the first to go down in the event the strike is protracted. The Pressed Steel Car Co. is seeking about 1500 tons of material for 500 hopper cars for the Bethlehem Steel Co. Demand from fabricating interests is fairly brisk. The leading independent here has withdrawn all quotations pending the settlement of the strike.

Canada Needs Tonnage

Buffalo, April 13.—Plate activity during the week has been light. An inquiry of 1000 tons is reported from a Canadian source. It is understood that the situation in Canada is rather stringent and that some shipyards have been forced to close down for lack of plates.

Little Tonnage for 1920

Chicago, April 13.—While the leading interest has a small tonnage remaining of its plate mill capacity for 1920 delivery, this is being eaten into daily and probably will disappear shortly. Most sales of plates by this interest give no promise of delivery, but the expectation is to cover most of present commitments during this year. Its quotation remains firm at 2.92c, Chicago mill. The leading independent will apportion its remaining plates during the present week, but has not determined its price. It appears certain that plate tonnages have been taken recently by at least one eastern producer at 4.00c, Pittsburgh, and prompt shipment has been given.

Warehouse Demand

Continues Unabated Despite Rail Strike—Prices Unchanged

New York, April 12.—Despite the railroad strike, demand in the local warehouse market continues unabated. Some consumers in the outlying districts, it is believed, are not aware of the widesweeping effects of the strike, while others are going ahead on the assumption that the tie-up will be of short duration. Should the railroad trouble continue for any length of time, however, a marked depressing influence undoubtedly would be felt. Prices are unchanged, with demand principally for bars and sheets.

Shape Demand Heavy

Philadelphia, April 13.—Iron and steel jobbers here say that a considerable portion of the current demand for material out of stock is coming from distant points. This is especially noticeable in shapes, for which there is considerable demand from the West. Jobbers continue to have a great deal of trouble in replenishing their stocks, and few of them have any sheets or small bars or bar size shapes in stock. In many cases the major portion of the steel products which are being shipped to jobbers here is being unloaded and shipped direct to consumers, and thus never sees the warehouses. Prices are unchanged.

Resigns Presidency

J. V. W. Reynders, who with a group of associates acquired the American Tube & Stamping Co., Bridgeport, Conn., in December 1917, is relinquishing the presidency which he assumed temporarily during the reorganization period.

Conditions brought about by the war necessitated his continuance as executive head beyond the period that was originally intended, and Mr. Reynders now has asked to be relieved in order to devote his time more exclusively to his private practice as financial and commercial adviser in the manufacture of steel. He remains on the executive committee and will also continue to act in an advisory capacity.

Scrap Market Unsettled

Shutting Off of Shipments Due to Strike Depresses Prices—Some Dealers Are Embarrassed — Railroad Lists Are Heavy

FOR COMPLETE SCRAP PRICES SEE PAGE 1164

Chicago, April 13.—The full effect of the present strike by railroad yardmen is being felt by scrap iron and steel dealers, and it is almost impossible to move any material in the Chicago switching district. Scrap moving toward the city which can be diverted to consumers outside the disturbed area is about the only active feature. Most consumers find their operations interfered with seriously and would be unable to use scrap if it could be delivered to them because of fuel shortage. One feature of this situation is that considerable money is tied up in the tonnage held on railroad tracks, and some smaller operators are becoming embarrassed because of their capital being held up by material on which they can realize nothing. Railroad offerings at present are a little heavier than usual. The Southern offers 3545 tons, the Santa Fe 2200 tons, the Wabash 1200 tons, the Northern Pacific 1000 tons, and the Chicago, St. Paul, Minneapolis & Omaha 900 tons.

Trading Is Paralyzed

New York, April 12.—Due to one of the worst traffic tie-ups in recent years, trading in the local scrap market has been brought to a virtual standstill. All lines, with the possible exception of the Reading, are refusing to accept freight, and the trade, consumers and dealers alike, are centering all efforts on adjusting conditions where possible. A number of the mills and plants are facing, at least a partial shutdown due to scarcity of fuel. So far as can be learned, however, no restrictions upon production have yet been put into effect in this district. While the market is nominal, some changes appear obvious. Clean cast borings are off about $1, holding at $17 to $17.50 f.o.b. New York; stove plate is off $2, being quoted at $28 to $29. Steel car axles are up about $2, holding at $39 to $40.

Market Is Very Unsettled

Pittsburgh, April 13.—The transportation tieup has served to render duller and even more unsettled the scrap iron and steel market here. Prices of all of the steel works grades are off at least $1 a ton from their recent levels and steelmakers interested to the extent of making a bid are not offering within a couple of dollars of the price considered minimum by dealers. One steel company which recently took on a tonnage of heavy melting steel at $26, now is bidding only $23.50 for that grade. Steelmakers generally remain out of the market and as a class probably will not be in again for some time. The plant suspensions resulting from the strike mean present stocks will last longer and these recently were estimated to be sufficient to carry the works well into May. Other steel works grades are down in sympathy with heavy melting steel, but the market continues to exhibit a fair degree of strength on foundry material, supplies of which remain extremely light. Rerolling rails continue to weaken under a light demand. Receipt of some fair-sized orders by the car builders tends to sustain the market in old car wheels. Railroad scrap offerings are rather heavy. The Baltimore & Ohio offers about 25,000 gross tons, including 12,000 tons of miscellaneous yard material and about 12,000 gross tons are offered in the April list of the Norfolk & Western.

Mills Not Interested In Scrap

Philadelphia, April 13.—The scrap market here is quiet, shipments are halted by the railroad strike and mills are showing no interest in scrap, their chief concern being their coal supply. Most scrap business at present is between dealers with the market generally weak and prices lower.

Buffalo Market Lifeless

Buffalo, April 13.—The beginning of this week finds the market in a dead condition. The market prior to the strike of the switchmen was extremely quiet, and the influence of the strike has been to paralyze all activities. The strike rendered it impossible to bring in material, ship it out, or even make intra-city transfers. Prior to the strike there was little or no activity, or rather just enough in each grade to bolster up the market. With the cessation of railroad activities and the consequent embargoes this has completely died down.

No Shipments Are Moving

Cleveland, April 13—Not a pound of scrap iron and steel is moving in the Cleveland district. Melters are embargoed, yards are unable to work their accumulations out and have laid off some labor, while prices generally have receded. Even heavy cast, which with other foundry grades has been the only strength of the local scrap market recently, has slumped because of the inability of yards to handle it. Every grade on the Cleveland list with the exception of stove plate, iron axles, steel car axles, railroad malleable and No. 1 cast has been marked down. No. 1 cast is the only valley scrap grade to hold up. Weakness just now is more pronounced in No. 1 and No. 2 busheling than in any other descriptions. Further price recessions are feared if the strike continues a few days longer.

Strike Hits the Market

Cincinnati, April 12.—The railroad strike has hit the scrap market hard and there is little activity and practically no movement of stocks. Added to this dealers in this territory are experiencing a renewed labor shortage and are having difficulty in getting men to prepare stocks for shipment. One interest has been carrying big display advertisements in daily newspapers for help for the past 10 days, offering exceptionally attractive wages and others are giving special inducements through employment agencies, but the results are by no means satisfactory and business is handicapped. Mill yards are well supplied with scrap and dealers have accumulated some surplus of certain grades. Buying has been moderate. Some good inquiries are in the market but actual sales are light.

St. Louis Market Quiet

St. Louis, April 10.—The scrap iron and steel market is inert. Nothing whatever is transpiring, even between dealers. The apathy has been emphasized by the strike of switchmen, resulting in partial embargoes, and extreme difficulty in getting cars to the plants. Mills and foundries announce they will purchase nothing until the labor situation clears and there is some assurance that inbound and outbound freights can move normally. Most of the consumers have supplies on hand to enable them to keep busy for a long while. Prices are on the downgrade, notable reductions having been made in dealers' lists during the week, the cuts ranging from 50 cents to $2 a ton. Yard interests, which are suffering from a serious shortage of labor, are loath to take on tonnages, even at concessions under latest quotations. Some dealers who sold short recently are covering at fair profit, but new business is unusually scarce. The railroads are offering more freely. Among the new lists are: Wabash, 3000 tons; St. Louis & San Francisco, 2000 tons; Missouri, Kansas & Texas, 600 tons, and St. Louis & Southwestern, 450. Fundamentally, conditions remain sound. Consumption continues on a large scale, and mills and foundries have orders ahead which will keep them busy indefinitely. There is still an enormous quantity of scrap to be bought for the last half.

Southern Market Inactive

Birmingham, Ala., April 13.—The scrap iron and steel market in the south still is inactive. No general lowering of dealers' prices is noted and melters of heavy melting steel decline to pay the figures quoted. Offers made by the large melters of $5 per ton less than the general dealers' quotation are being accepted by dealers in some parts of the south. Stocks in the yards of dealers are just sufficient to meet present needs. Consumers are looking for lower prices.

Output Held Up

In Tubular Products But Week's Tieup Will Cause Suspensions

Pittsburgh, April 13.—While the shipments of tubular goods has been halted by the freight tieup resulting from the railroad yardmen's strike, only the plants in the Youngstown district yet have suspended operations. Lack of fuel has forced the Republic Iron & Steel Co. and the Youngstown Sheet & Tube Co. into idleness. The National Tube Co. reports all plants still in operation and that it is stock-

ing its production. The Wheeling Steel & Iron Co. and LaBelle Iron Works, still were running today and in Pittsburgh, the Jones & Laughlin Steel Co., the A. M. Byers Co. and Spang, Chalfant & Co., are running, though making no shipments. If the railroad tieup continues beyond this week, it is probable that some of these companies will have to suspend. The Girard, O., plant of A. M. Byers Co. can keep going for about a week, but suspension at its Pittsburgh plant is unlikely unless the tieup is protracted. Marketwise, the situation is unchanged save for the fact that makers are more completely out of the market on new business than they have been. Current inquiries are being filed or refused by all makers at present, pending a settlement of the railroad trouble.

Small Sizes Bring Premiums

New York, April 12.—Smaller sizes of cast iron pipe, especially where favorable deliveries can be promised, are bringing a premium in a number of instances of approximately $2. Demand continues urgent, and with deliveries three and four months off, an unusually strong situation prevails. No general advance, however, has yet been made. Inquiry, while strong, has fallen off somewhat due to the attention now being centered upon the rail strike, and pipe makers have much to engage their attention in the same direction. Operations so far have not been affected. Municipal demand remains dull.

Cities Buy Almost Nothing

Chicago, April 13.—Apparently cities which have funds with which to buy cast iron pipe have covered their requirements for the year, and others having trouble with financing may not be able to take much tonnage. At any rate, the pipe market in the West is devoid of inquiry from this source. However, shops are busy on tonnage already booked and considerable selling is being done constantly for industrial purposes and by private buyers for housing projects and the like. This is made up for the most part of small tonnages but the aggregate is heavy. In some respects this buying is preferable to that done by cities as it is spread out over the year, while pipe for city use usually is bought at one time for the entire season.

Pipe Market Strong

Birmingham, Ala., April 13.—While there is less demand for smaller sizes of cast iron pipe, sufficient contracts are in hand for steady operation of all plants. Shipments are still delayed. Quotations remain the same as they have been for the past month. Several large contracts are in prospect. The American Cast Iron Pipe Co. announces that the electric furnace installed at its plant is proving successful in the manufacture of lightweight cast iron pipe.

Investment bankers of Cleveland are offering $600,000 eight per cent cumulative preferred stock of the Peerless Drawn Steel Co., Massillon, O., at par. The company was established in 1914 and sales for 1919 totaled $2,924,601 net current assets were $762,065 as of Feb. 28.

Sheet Mills Are Hard Hit

Strike Heavily Curtails Operations in Principal Districts—American Sheet & Tin Plate Co., Opens Last Half Books

Pittsburgh, April 13.—The switchmen's strike not only has affected shipments of sheets, but also has curtailed mill operations. The American Sheet & Tin Plate Co., which recently had more than 90 per cent of its sheet mills in operation, this week reports less than 70 per cent active. This condition is due less to the ability of the company to ship material than to the fact that a number of important plants were unable to accumulate any reserve supplies of fuel or steel. Independent companies also have suffered considerably because of the scarcity of fuel. Opening of the books of the American Sheet & Tin Plate Co. for last half business took place today and announcement has been made that the company will allot its production for that period as it did during the first half of the year. No figures as to the amount of tonnage that will be available have been given out, but the general impression is that the carry-over of first half business will not amount to much more than a month's output, and the assumption is that the tonnage to be allotted will be fairly heavy. Rumors have been current that the American Sheet & Tin Plate Co., contemplated imposing a higher price on open hearth than on bessemer steel, but this is officially denied and it is stated that the company will make no change from the March 21 schedules, either as regards base prices, extras or differentials. While no official opening of books for third quarter business has been announced by any of the independent companies, some of them are taking such business with minimum quotations of 5.50c for black, 7.00c for galvanized and 5.00c for blue annealed.

Youngstown Mills at Standstill

Youngstown, O., April 13.—Production of sheets in this territory practically is at a standstill, and indications are that all plants will be idle before the end of this week. Sheet mills now inactive due to the switchmen's strike include those of the Youngstown Sheet & Tube Co., the Mahoning Valley Steel Co., the Republic Iron & Steel Co., and about 20 per cent of the Brier Hill Steel Co.'s units. Mills running early this week included those of the Trumbull Steel Co., the Sharon Steel Hoop Co., and the Falcon Steel Co. All grades of sheets were piled high in mill warehouses here prior to the present tieup. Third and fourth quarter business is being accepted from regular customers by certain mills here. A large proportion of sales have been closed with western buyers who are willing to pay higher prices than the mills can obtain in the East. Some No. 10 blue annealed for third and fourth quarter has been booked at prices ranging from 6.50c to 7.00c, Youngstown. These prices are high compared with recent bookings of other companies here, who expect to quote between 5.50c to 6.50c. A carload of blue annealed seconds recently brought 6.55c, mill. Jobbing interests who placed business last January with the leading sheet producer for first quarter delivery have been notified that shipment cannot be made until August on account of delayed rollings. This announcement was made before the present railroad tieup. Conditions now indicate that shipments will be deferred still further. Black sheets of stamping quality and automobile sheets still are in heavy demand by the trade. Buyers are paying anywhere from 13.00c to 17.00c, depending upon the grade, for prompt shipment. Future rollings of automobile sheets are held considerably under these figures.

Tin Plate Output

Reduced Sharply by Strike—Third of Corporation's Mills Busy

Pittsburgh, April 13.—The strike of the railroad yardmen has sharply curtailed operations of the tin plate mills, largely because it has shut off fuel and steel supplies. Only 37 per cent of tin plate capacity of the American Sheet & Tin Plate Co., is in operation, or only about one-third of the number of mills that were running recently. Tin plate mills of the Jones & Laughlin Steel Co., thus far have not been affected by the labor situation as this plant is served by river transportation, and materials are available to keep it in operation for at least a week and probably longer. Most other independent companies, however, are served entirely by rail and had accumulated neither raw material nor fuel. The American Sheet & Tin Plate Co., opened its books for third and fourth quarter tin plate today and announcement was made that the company would allot its production as it did during the first half of the year. Present prices, which have been in effect since March 21, 1919, will continue and no change will be made by the company in extras or differentials. Independent makers are likely to name prices ranging anywhere from $7.75 to $8.50 against third and fourth quarter business from domestic sources, although it is probable that some of them will hold to the present base of $7 per base box, Pittsburgh. An export sale amounting to 15,000 boxes is noted at $12 and no tonnage for foreign shipment is available at less than $11.

Sell For Third Quarter at $8.50

Philadelphia, April 13.—Tin plate is being sold here for the third quarter at $8.50 to $8.75, Pittsburgh. Exporters say it is very hard to get supplies as mills do not like to pack for export. They have offered $11, $12 and $13 without obtaining them. A small lot of tin plate for a domestic consumer was sold at $10.

Some Good Awards Made

Pittsburgh Shop Takes 7,000-Ton Job—More Than 10,000 Tons Placed at New York—Plain Material Prices Not So Firm

New York, April 13.—Mill prices on shapes are softening with some mills, fabricators asserting that concessions approximating 10 per cent have been made by at least one or two mills on the general run of shapes. This is believed in some quarters to be due to the Steel corporation's continued adherence to old prices. The range of independent mill prices, however, is unchanged at 3.25c to 4.00c, Pittsburgh, with the higher figure for favorable deliveries. The majority of the mills are quoting around 3.75c. Several sizable contracts feature the local structural market. The largest calls for 6700 tons for an addition to the office building of the Western Union Co. in this city.

Acute Scarcity Is Likely

Pittsburgh, April 13.—While structural mills in this district show little change in operations due to the transportation tieup, they are likely to be among the first to be affected by a protracted strike. This is because stocking is not possible as in the lighter lines and the fact that cars may not be available for loading direct from the mills may bring early suspension. Few fabricating interests were getting full or prompt shipments against old orders before the railroad yardmen's strike and an acute shortage of early supplies appears probable. Structural inquiries still are reported fairly numerous, but lettings are not quite as numerous as they were recently. The McClintic-Marshall Co. has taken 7000 tons for a new refinery in Baltimore for the American Sugar Refining Co.

Shape Tonnages Run Small

Chicago, April 13.—Closing of contracts for structural material is confined largely to small lots and occasional instances are met where plans for large buildings have been given up because of material cost and labor difficulty. One of the latter instances is the Loridan hotel, Chicago, which had been expected to take a heavy tonnage. Additions to existing buildings in Chicago to take advantage of the added height recently granted by ordinance also are slow to come out. The leading interest is quoting 2.72c, Chicago mill, on plain material.

Most Activity in Exports

Philadelphia, April 13.—The Eastern Steel Co.'s shape mill at Pottsville is down for lack of coal, and other shape mills are expected to go down soon on account of the railroad strike. The most activity in the past week has been in export buying for the United Kingdom. Italy bought some tonnage paying 4.25c, Pittsburgh, for structurals, and 4.50c for ship shapes. Shapes are now bringing in many cases ¼ cent more for export than plates. Japan placed 4000 tons of ship shapes at a lower price quoted some time ago. India placed 2000 structural shapes, and the Dutch East Indies several hundred tons. Several other smaller export lots also were placed. While one independent last week took business from regular customers at 3.15c, Pittsburgh, the usual price of the independents is 3.50c to 4.00c, and shipments from stock at 4.25c. Domestic inquiry last week improved, but the situation is now dominated by the strike. No structural lettings are reported. Fabricators say if the strike continues they must shut down within two weeks.

CONTRACTS AWARDED

Miscellaneous buildings for Newport Co. at Carrollville, Wis., 700 tons to Worden-Allen Co.

Peoples Banking & Trust Co. building, Marietta, O., 321 tons, to American Bridge Co.

Mill building for Hoskins-Moralnville Paper Co., Menominee, Mich., 316 tons, to Worden-Allen Co.

Warehouse for Savage Tire Co., San Diego, Cal., 197 tons, to California Iron Works, San Diego, Cal.

Refinery for the American Sugar Refining Co., Baltimore, 7000 tons, to the McClintic-Marshall Co.

Plant extension for Atlas Crucible Steel Co., Dunkirk, N. Y., 1200 tons to the McClintic-Marshall Co.

Addition to Western Union building, New York City, 6700 tons, awarded to American Bridge.

State bridge at Newburgh, N. Y., 1600 tons, to American Bridge.

Bank building addition, Wilmington, Del., 200 tons, to Dietrick Bros.

Highway bridge, Asbury Park, N. J., 350 tons, to independent.

Plant for American Brakeshoe & Foundry Co., Newark, N. J., 1000 tons, to Levering & Garrigues.

Storage tanks for the New Orleans Refining Co., New Orleans, 1800 tons, to Standard Boiler Works.

Plate Shop for Newburgh Shipyards Inc., Newburgh, N. Y., 800 tons, to American Bridge.

Bridge work for Norfolk & Western, 650 tons, to American Bridge Co.

Office building for Barrett Co., New York, 3600 tons, to Heddon Iron Construction Co.

Gillespie building, New York, 1200 tons, to Heddon Iron Construction Co.

Addition to refinery Standard Oil Co. at Toledo, 250 tons to the Mt. Vernon Bridge Co.

Building for Champion Engineering Co., Canton, O., 150 tons; to Bellefontaine Bridge & Steel Co.

Building for M. & M. Drawn Steel Co., Erie, Pa., 300 tons; general contract let to Henry Shank, Erie.

Two factory buildings for James H. Gloyd Co., Grafton, O., 200 tons; to Fort Pitt Bridge Works.

CONTRACTS PENDING

Office building for Standard Oil Co., Milwaukee, 800 tons, bids asked.

Roosevelt theater, Chicago, 600 tons, Henry Brickson, contractor, bids asked.

Hotel at Atlantic City, N. J., for Du Pont de Nemours Co., 3000 tons; bids being taken.

Heat treating plant for General Drop Forge Co., Buffalo, N. Y., 130 tons; bids being taken.

Pit furnace building for Interstate Iron & Steel Co., South Chicago, 125 tons, bids asked.

High line trestle for Wisconsin Steel Co., South Chicago, 800 tons, bids asked.

Little Loss

Yet Shown in Wire Mill Production —Trucks Being Used

Pittsburgh, April 13.—While the movement of wire and wire products from Pittsburgh plants, except that which is being moved by motor trucks, has been halted by the transportation tieup, plant operations are unaffected. The plant of the American Steel & Wire Co. at Farrell, Pa., has suspended because of a lack of fuel, but the Donora, Pa., and other Pittsburgh district plants of this company are in operation. Plants of the Jones & Laughlin Steel Co. both here and at Woodlawn, Pa., are running, but this company withdrew from the market late last week following the announcement by the Pittsburgh & Lake Erie railroad that it could not accept freight for the west after midnight, April 9, nor for the east on April 10. The Pittsburgh Steel Co. has its plant at Monessen, Pa., running, but a shortage of limestone tnreatens to bring an early suspension. This company is served on fuel by water, but depends entirely on rail shipments for limestone supplies and its present stocks hardly are sufficient to last more than this week. Practically all companies are out of the market on new business and hardly will re-establish quotations until either the strike is over or gives signs of coming to an end.

Railroad Strike Discouraging

New York, April 12.—The railroad strike situation is causing considerable concern to wiremakers, who only recently had begun to catch up with requirements and considered they shortly would be able to modify the policy they have followed for six months, of rationing their customers. By reason of recent railroad embargoes it has been very difficult for manufacturers, especially in New England, to pile up stocks of coal and other materials, so that if the strike situation continues to gain momentum, it will not be long before operations at plants and among them, wire mills, are affected.

Cannot Ship Nail Product

Chicago, April 13.—Wire and nail mills in this district are not greatly affected by the present strike of yardmen, as far as production is concerned, but are meeting with considerable difficulty when it comes to shipping the product. The effect of the strike on

More Cars

Included in New York Central Order —Equipment Inquiries Keep Up

New York, April 12.—The New York Central has increased the total number of freight cars recently ordered to 8200 and now is inquiring for an additional 1000 stock cars which are expected to be placed shortly. It has placed a total of 265 passenger cars and has placed or will place 193 locomotives.

Of the freight cars placed, 3500 went to the Standard Steel Car Co. 3500 to the American Car & Foundry Co., 500 to Haskell & Barker, and 500 to Pressed Steel Car Co. The greater portion of the 265 passenger cars awarded went to the Standard Steel Car Co., and the American Car & Foundry Co., each receiving orders for 100. Other car orders involve 500 gondolas for the Rock Island to the Bettendorf Mfg. Co.

The largest new locomotive inquiry to be reported is one involving 30 locomotives for the Chicago, Burlington & Quincy, the Missouri Pacific is asking for 15 Mikado-type loco-

The Southern Pacific is inquiring for 40 locomotives.

Spike Makers Out of the Market

Pittsburgh, April 13.—Makers of spikes who for several weeks past have

been accepting only limited tonnages and these only from regular customers, now are out of the market entirely on account of the interruptions of the movement of freight due to the strike of the railroad yard men. Business in other track material also has come largely to a standstill because of the transportation situation.

Locomotives Are Wanted

Cleveland, April 14.—The Southern Pacific railroad is in the market for 40 locomotives and one of the builders is inquiring for about 1000 tons of material against this business. The Lackawanna Steel Co. has sold the Clover Leaf 2500 tons of open-hearth 80-pound rails at $57, mill.

Some Cars Being Bought

Chicago, April 13.—While not much activity is being exhibited in the market for railroad freight cars, either in buying or inquiry, a little business is being done. The New York Central Trunk railroad has awarded 3000 box cars of which the American Car & Foundry Co. will build 2000, the remainder going to a Canadian builder. The Baltimore & Ohio railroad is inquiring for 1500 box cars, 600 flats and 500 refrigerator. The Nickel Plate has issued an inquiry for 500 hoppers, the Southern Pacific for 250 ballast cars, and the Chesapeake & Ohio railroad is having plans drawn for 1000 coal cars.

Considerable inquiry for odd lots of standard steel rails such as 500 tons or so is being received from smaller railroads, and two such lots were closed recently without the promise of delivery date. One inquiry for 25,000 tons of rail has been received, asking delivery in 1921.

Ingot Production

In March Shows Substantial Gain Over February Output

The production of steel ingots for March totaled 3,296,799 gross tons, according to the monthly production figures compiled by the American Iron and Steel institute. Representing the output of 30 companies which in 1918 produced about 84.03 per cent of the ingots produced in the United States, the tonnage produced in March is a gain of 431,675 tons over the 2,865,124 tons of February.

Of the total output, 2,484,995 tons were made by the open-hearth process, 795,164 tons by the bessemer process and 16,640 tons by all other methods. For February, the corresponding figures were 2,152,106 tons by the open-hearth process, 700,151 tons by the bessemer process and 12,867 tons by all other methods.

For the 30 companies reporting production figures, the average daily production was 122,103 tons and since these companies produced about 84.03 per cent of the total in the country for 1918, the approximate average daily production for the country was 145,308 tons. This is an improvement over February of over 3000 tons per day. The yearly rate for the 30 companies was 37,607,724 tons per year or 44,754,864 tons for the whole country.

Calm In Semifinished

Business Comes Practically to a Standstill, but Prices Are Firm —Mills Feel Shortage of Steel

Pittsburgh, April 13.—While the effect of the transportation tieup on the production and shipments of semifinished steel has been drastic in the Mahoning and Shenango valley districts, operation of the steel works in and around Pittsburgh and in the Wheeling district has not yet been affected. The various plants of the Steel corporation's subsidiaries strung along the rivers in the Pittsburgh district are able to secure fuel supplies by water, and while stocks of steel which accumulated as a result of the recent shortage of cars are heavy, storage space is not so fully occupied as to interfere with plant activities, at least for a time. Plants of the Jones & Laughlin Steel Co., here and in Woodlawn, Pa., are running and the Pittsburgh Steel Co., has its plant at Monessen, Pa., in operation. Enough fuel is available at the latter plant to keep it going at least this week, and, being served by water, it might run even longer if it were merely a question of obtaining coal and coke. It is running light on limestone supplies, however, and only an early restoration of rail service will prevent a suspension for want of this material. Business has come practically to a standstill as a result of the tieup of railroad transportation, but it was showing signs of letting down from the recent extreme activity before this trouble developed. Some interests look for an excited market with the termination of the trouble on the theory that finishing mills will use up such supplies as are available and want considerable tonnages to get actively going. Prices are holding at about the recent levels, with rerolling billets at $65 to $75 for either bessemer or open-hearth steel; sheet bars at $70 to $80 for open-hearth and about $10 per ton less for bessemer stock; wire rods at $70 to $75 for common rods; $80 for bessemer screw stock rods, and up to $100 for high carbon rods.

Prompt Rerollers Sold at $65

Philadelphia, April 13.—Several lots of rerolling billets of several thousand tons each were sold in the week at $60 to $65, Pittsburgh, the higher price being paid for prompt shipment. Forging billets in small lots sold at $75 to $80, Pittsburgh.

No Indication of Weakness

Youngstown, O., April 12.—Present demand does not indicate any softening in the market for sheet bars. Some tonnages were offered last week, but this was due to the fact that certain mills had export business on schedule which had to be deferred until the embargo on eastern shipments was lifted. To fill the gap in rolling schedules the mills accepted just enough business to take up the slack. Their offerings were absorbed quickly by regular customers. In certain quarters considerable backed-up business was cleaned up last month and the mills were about ready to start on second quarter orders when shipments were interrupted by the switchmen's strike. Bessemer sheet bars are quoted in this district between $75 and $80, and the open-hearth grade between $80 and $85, Youngstown.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
April 7	19.25	61.50	9.25	8.50	33.00	10.75	43.00
April 8	19.25	61.00	9.25	8.425	33.00	10.75	43.00
April 9	19.25	61.00	9.25	8.425	33.00	10.75	43.00
April 12	19.25	64.00	9.25	8.50	33.00	10.625	43.00
April 13	19.25	63.00	9.25	8.50	33.00	10.625	43.00

*Future shipment from Singapore or London.
†American Smelting & Refining Co.'s price.
‡Producers, second quarter, June-July-August 19.50c.

NEW YORK, April 13.—Although the railroad situation has removed consumers' buying interest almost entirely from the nonferrous metal markets in the past few days, prices are holding firm for the most part.

Zinc is steady at 8.50c for prime western at East St. Louis, which is a little higher than several sales last week.

Tin moved up yesterday largely on account of a jump in the price at London, after low prices several days ago and much irregularity in the past few weeks. It was expected the high price yesterday would quickly shrink on account of the transportation situation, and although the price of spot today was 63c to 63.25c, or about a cent less than early yesterday, the drop was not as rapid as had been expected. There is active buying of tin in London, including some by this country. On account of the low shipments from the Straits last month, visible supply is low and the market is in a strong position. The near-future of the metal depends much upon the railroad situation. In addition to this trouble, the coming metal is hindered from being landed at New York by a harbor strike.

Copper is holding to the recently established levels of 19.25c delivered for spot and second quarter, 18.50c for third quarter. These are producers' prices to consumers on electrolytic. Casting is 18.75c and lake 19.37½c to 19.50c. The outside electrolytic market is down to 18.50c on prompt metal at refinery, but not much has been done in the outside market. Stocks of copper are going into the extraordinary consumption of this country more rapidly than metal is being produced, sales in the past few months being several hundred million pounds larger than crude output of the mines. Foreign buying is expected to assume good size before long, but still is small. Brass and copper product mills and foundries have orders on hand for many months and excepting on red, early deliveries on new orders are almost impossible. Some mills are not even accepting.

Lead shows little change. Not much buying is being done just now but the market is sold many months ahead. The outside market is 9c New York.

Strike Paralyzing Steel Industry

Railroad Switchmen's Walkout Speedily Forces More Than 50 Blast Furnaces To Blow Out—Mills in Youngstown District Operating at About 25 Per Cent of Capacity — Effect May Be Worse Than Steel Strike

MORE than 50 blast furnaces are idle as a result of the "unofficial" strike of railroad switchmen, according to latest telegraphic reports to THE IRON TRADE REVIEW from the principal iron and steel districts of the country. The Mahoning and Shenango valleys have been the most seriously affected. In the Mahoning 18 out of a total of 25 stacks were banked, and in the Shenango 12. Other districts reported the following number banked: Chicago, 10; Buffalo, 4; Cleveland, 3; eastern Pennsylvania, 2; Pittsburgh proper, 2, a total of 51. No furnace in Alabama had been banked up to Tuesday.

Reports from all districts relating to blast furnace operations state that more furnaces must be banked within a few days unless the strike is settled, and this situation is particularly true of Buffalo and eastern Pennsylvania. More than a score of furnaces are mentioned as being operated on slack blast. The biggest problem is the lack of coke. Reports from the Connellsville regions are that practically all production is suspended because of the inability to move shipments.

While the record of blast furnace operations affords the truest index of conditions due to the strike affecting the shipments of raw materials, the steelworks and mills are in almost as serious predicament. Coming as a climax to a prolonged period of car shortage during which many mills had filled most of their available storage space with finished material, the effect of the strike has been to choke further production. While steelworks and rolling mills have curtailed operations to a considerable extent, however, the full force of the strike is not likely to be felt in these departments for several days. Then the strike appears likely to prostrate the mills more completely than the steel strike last fall.

Mills in the Mahoning valley are not working at more than 25 per cent of capacity, but those in the Pittsburgh district are much more fortunate, due to the fact that they receive coal and coke shipments by means of water transportation. The American Sheet & Tin Plate Co. has reduced the operations at its tin plate mills to one-third of what they were before the strike, while sheet mills both in the Youngstown and Pittsburgh districts have been particularly hard hit owing to the fact that they have stored heavily while struggling for weeks against a car shortage.

Little iron ore is moving from the lower lake docks to furnaces, but furnaces are not embarrassed so much by lack of ore as of coal, coke and limestone. The amount of ore on hand at furnaces April 1 was 14,700,000 tons, distributed among 325 furnaces, and furnaces have from two to three months' supply.

Output Loss Heavy If Strike Continues

PITTSBURGH, April 13.—If the strike of the railroad yardmen is not promptly settled, the effect on the iron and steel industry in this and adjacent districts is likely to be even worse, as far as plant operations and production are concerned, than was the steel plant strike itself. Already the steel works and blast furnaces in the Mahoning and Shenango valley districts largely are idle and if the suspension of rail transportation continues for another week, a number of plants and furnaces which remain in operation will be obliged to shut down.

All of the railroads in and out of Pittsburgh have placed embargoes on the movement of freight, other than perishable foods, and the situation has become so acute that mail and passenger train service may be curtailed. No break has occurred in the ranks of the strikers here, and not a distributing yard of any of the roads serving the Pittsburgh district is operating today even in part.

Since most of the Pittsburgh plants are served with fuel by water, it is believed that many of them can keep going for some time. With the large stocks of material which have accumulated at these plants, however, a congestion might develop which will take longer to overcome than the loss of production.

The Carnegie Steel Co. has 14 of its stacks out or banked, due to the strike, including two at Clairton, one at Isabella, four at Newcastle, three at Farrell and five at Youngstown, and it expects to bank its furnace at Mingo, and two stacks at Bellaire, O., Wednesday, due to the shortage of fuel. The company's finishing mills at Newcastle, Sharon, Farrell, Homestead and Duquesne and its Edgar Thompson mills are running. Several finishing mills at the Homestead plant went down Monday night because of the heavy accumulation of finished material. The Columbus, O. plant as well as the Twenty-eighth street mills in Pittsburgh are down, while the Painter and McCutcheon mills are operating only in part.

Plants of the Wheeling Steel & Iron Co., Wheeling, W. Va., LaBelle Iron Works, Steubenville, O., and the Whitaker-Glessner Co., Wheeling, W. Va., were running today, but how long they can continue to run cannot be definitely stated. All steel plants in the Monongahela valley were in operation, but not moving a pound of material, other than what was being carried away in motor trucks. The Pittsburgh Steel Co. had its plant at Monessen, Pa., running, but it was stated that it would be obliged to suspend unless rail shipments of limestone were restored by the end of the week.

The Jones & Laughlin Steel Co. had all departments at both its plants in operation. The National Tube Co. reports all its plants running, but that all production is being stocked. Arrival of fuel by water will enable the Carnegie Steel Co. and the Jones & Laughlin Steel Co. to keep their by-product plants going.

Practically all of the steelworks blast furnaces in the Mahoning and Shenango valleys have suspended and five merchant stacks in those districts have stopped blowing. The latter comprise stacks Nos. 1 and 4 of the Shenango Furnace Co., Sharpsville, Pa., the Claire furnace, Sharps-

ville, operated by E. W. Mudge & Co., Pittsburgh, the Alice furnace of the Valley Mould & Iron Corp., Sharpsville, Pa., and the stack of the Sharpsvile Furnace Co., Sharpsville.

The Ella furnace at West Middlesex, Pa., operated by E. W. Mudge & Co., Pittsburgh, the Fannie furnace, operated by M. A. Hanna & Co., Cleveland, also at West Middlesex, Pa., still are in blast, as are also the McKinney Steel Co. stacks at Josephine and Scottdale, Pa., the American Manganese Mfg. Co. stacks at Dunbar, Pa., the Cherry Valley furnace, operated by M. A. Hanna & Co., and the McKeefrey Iron Co. stack at Leetonia, O., and the Mattie furnace of the A. M. Byers Co. at Girard, O. Few of these stacks, however, have more than a week's supply of fuel on hand and withdrawal of blast is likely unless the strike ends this week. Some already are running at checked blast.

Practically all outlets from the Connellsville regions are shut off and very little coke has left the district except for short distances in the past 48 hours. Production of coke is heavy for the reason that a full car supply was available yesterday and those not loaded yesterday will be loaded today. If the strike is ended by Thursday or Friday, the loss of iron production will be slight, as it will be possible to provide good supplies of coke from loaded cars now laying on sidings or in the producing districts.

All Shipments Stopped in Mahoning Valley

Youngstown, O., April 12.—All movement of freight in and out of the Mahoning valley has been stopped by the strike of the switchmen. Steel plant operations have been seriously affected, although some works continue to operate by drawing on their coal reserves. The Carnegie Steel Co. has three of its six furnaces at the Ohio works, in blast and can keep these stacks running for at least a week by using coke from its stock pile. Its open-hearth furnaces are idle, the output of the three stacks being converted by the bessemer department. The only rolling mills active are those necessary to handle the bessemer production.

While two stacks at the East Youngstown plant of the Youngstown Sheet & Tube Co. were operating today, officials planned to bank one of these Tuesday. Two other stacks already are banked. Only one battery of ovens was on coke the remaining three batteries being on gas. All other departments were idle. Two blast furnaces at the Haselton plant of the Republic Iron & Steel Co. are in operation and the three other stacks in this group are banked. Coke is being supplied by one battery of ovens, the company keeping the remaining ovens on gas with coal being hauled to the plant in automobile trucks.

The Brier Hill Steel Co. has two blast furnaces banked and one in blast. Production is being maintained in the open-hearth department, while the mills are rolling at 80 per cent of normal. Officials state that operation at the present rate can be continued over the balance of this week when the coal supply will be exhausted.

At the Lowellville, O., plant of the Sharon Steel Hoop Co., four of six open-hearth furnaces were being charged regularly. While the company's continuous-type billet and sheet bar mills at this plant were idle Monday, officials expected them to be operated by the night crew. The coke supply being cut off, the company was compelled to bank its Mary furnace. Its sheet and galvanizing departments in Youngstown are still operating. The Struthers furnace at Struthers, O., is banked.

In the upper part of the Mahoning valley the Girard, O., stack of the A. M. Byers & Co., is banked. Operation in the puddling department of the company is not affected. The sheet mills of the Falcon Steel Co., Niles, O., were rolling today and will continue as long as the coal supply lasts. All sheet mills at the Niles works of the Republic Iron & Steel Co. were shut down Saturday and will not start again until conditions warrant. The tin plate mills at the Liberty plant of the Trumbull Steel Co., Leavittsburg, O., also are idle.

Ten Stacks Are Banked in Chicago District

Chicago, April 12.—About 50 per cent normal operation is being maintained by most steel mills in this district. As a result of the strike of railroad yardmen, movement of raw material into mills and finished material from them is reduced to a minimum, and is irregular. The Inland Steel Co., has been able to keep its three blast furnaces active, but faces the prospect of blowing out one if more fuel is not received soon. Other conditions of transportation are causing mill production to be reduced materially. The Illinois Steel Co. has five stacks active at the Gary plant and the same number at South Chicago, having six banked at Gary and four banked at South Chicago. Open hearths and finishing mills are active in proportion to the blast furnace operation. The plants at Joliet and Milwaukee, both much smaller, are not affected much. Among smaller mills some are operating full, some are more or less interfered with, and a few have found it impossible to continue operation. The situation will continue to cause trouble even after the strike ceases, and loss of production will be felt for several weeks at best.

Ore Docks Are Affected; Shipments Held Up

Cleveland, April 13.—Shipments of iron ore from lower lake docks to blast furnaces are being held up as a consequence of the railroad switchmen's strike or embargoes due to the strike. The tieup, however, is not complete, as some of the docks are working at full capacity, although with considerable uncertainty as to how long they may continue to do so. No loading was done at the Cleveland & Pittsburgh railroad docks in Cleveland on Monday, but work was in progress as usual at the Erie railroad docks. The Toledo docks were idle and no shipments were made from the National Tube Co.'s docks at Lorain, O., although the Baltimore & Ohio railroad arranged to take 10 carloads of ore to Bellaire, O., on Tuesday. Huron, O., docks were working at 100 per cent. No strike was reported at Fairport, O., but an embargo served to suspend work at the docks. Some shipments were made from the New York Central railroad docks at Ashtabula, but a serious car shortage interfered with operations. All the men except one yard crew were out at the Pennsylvania railroad switchyards in Ashtabula. The company announced that it could handle 120 carloads of ore on Tuesday. Car shortage held up work at Conneaut, while docks at Erie, Pa., were working as usual.

Three hundred and twenty-five blast furnaces had 14,700,000 tons of iron ore at their yards, collectively, on April 1. From the standpoint of tonnage only, this would be sufficient for about three months, but the tonnage was unequally distributed, and furthermore many furnaces required certain grades of ore to round out mixtures. Some of the furnaces are said to have but two weeks' supply of ore on hand, while others have four months' supply. The amount of ore on docks at Lake Erie ports April 1 was 7,534,406 tons.

The ore supply is considered a secondary factor in the difficulties of the

furnaces at present, but the decrease in consumption of ore due to the lack of fuel may have a serious effect on the total movement of ore from the Lake Superior district, which operators had hoped would equal if not surpass 62,000,000 tons.

Buffalo Furnaces Down; Mills Also Idle

Buffalo, April 13.—The Lackawanna Steel Co. has four furnaces banked as a result of the steel strike. The remainder of this company's furnaces and four furnaces of the Donner Steel Co., are on slack blast. The Buffalo Union Furnace Co. and Rogers, Brown & Co., are proceeding cautiously. All Lackawanna and Donner rolling mills are down, and the open-hearth furnaces are operating on a reduced basis. The Wickwire Steel Co.'s mills and furnaces are operating as usual.

The Genesee stack at Charlotte, N. Y. has been banked.

Most plants have sufficient fuel to last four or five days on reduced operation. The Semet-Solvay Co. is operating its coke plant on a reduced basis, but there is promise of a slight improvement in its coal supply.

Operations in East May be Stopped in Week

Philadelphia, April 13.—Iron and steel production in eastern Pennsylvania is seriously affected and will be completely stopped within a week if the railroad strike continues. The effect of a prolongation of the strike would be vastly more sweeping and demoralizing than the steel strike. The effects have been so quickly apparent because recent railroad embargoes, car shortage, and other obstacles prevented accumulation of coal, coke and other materials. The plant of the Eastern Steel Co., at Pottsville, Pa., went down yesterday because of the lack of coal. All other steel plants in this district will be down before the end of the week unless coal arrives. The Alan Wood Iron and Steel Co. banked two furnaces Sunday.

One of the Warwick furnaces at Pottstown, Pa., and the stack at Oxford, N. J., also have been banked. Others are expected to be banked soon.

Embargo in Alabama

Birmingham, Ala., April 13.—While the switchmen's strike has not spread to the Birmingham district as yet, the railroads have placed embargoes on shipments of iron and steel to the north and east, and the effect of this is being felt to a serious extent at the furnaces and mills. No furnaces have been banked.

Three Furnaces Banked in Cleveland District

Cleveland, April 13.—Two of the Central group of furnaces of the American Steel & Wire Co., in this city, and the Emma furnace, has been banked, as a result of the switchmen's strike. Four furnaces of the McKinney Steel Co., two of the Cleveland Furnace Co., one of the Upson Nut Co., of this city, two of the Toledo Furnace Co., at Toledo, O., and the United States stack at Canton, still are running. Some of these plants, especially those connected with by-product coke ovens, are in position to continue unaffected for several weeks; others will be forced out if the present tieup extends a week or more. All shipments of pig iron and steel into or out of this city have been suspended, and current production is being piled in yards. Mill and steel works operations in this territory have been only slightly affected up to this time.

All Connellsville Plants to Close; 33,000 Idle

Uniontown, Pa., April 12.—From 33,000 to 35,000 men employed in the coal and coke industry in the Connellsville region are being thrown out of work as a result of the transportation tieup due to the switchmen's strike. Close observers predicted that by Wednesday evening all plants will be idle. A few plants suspended operations today. But the great majority will close down Tuesday, while a few will be able to operate until Wednesday, using cars placed for loading last week. Some cars were placed for Tuesday's loading, but no loads were moved, and the cars filled the side tracks, making impossible the placing of any additional empties.

Export Trade Is Heavy

NEW YORK, April 12.—Iron and steel exports have been picking up gradually, but the business has been concentrating in controlled hands. A report during the past week was to the effect that the Steel Products company has been selling plates and shipbuilding material to Europe for delivery throughout the first half of 1921.

During the past week, it was learned, 40,000 boxes of tin plate for delivery during fourth quarter were offered the exporters but inasmuch as no specific delivery date could be guaranteed the offering was not taken up readily.

The Consolidated Steel Corp. has put into effect new extras on nails, and new extras on galvanized sheets. These are the extras which were proposed last year. The sheet sales will be based upon No. 24 gage.

It is currently reported that 1000 tons of southern pig iron has been purchased by England at the domestic price. A Scandinavian buyer placed considerable tonnage of foundry iron in the New York district recently for prompt shipment. Substantial tonnages of iron have been booked with Italy, Sweden and Scotland.

One of the important English inquiries last week was for 4000 tons of ship plates for May shipment for which 4.25c, Pittsburgh, would be paid.

One of the largest export representative interests in this city estimates that it has standing inquiries averaging 50,000 tons a day for steel products, mainly from the Far East, and report that prospects are bright for closing on some of the business.

Japan has approached the market with an inquiry for 20,000 tons of plates, but it was refused. The Far East has also inquiries for 3000 kegs of nails for third quarter.

Prices still are fluctuating. Tin plate has been selling for $11 a base box, but it was reported last week that one big maker was approached with an offer to buy 20,000 boxes, the purchaser agreeing to pay $12 a box. This maker was compelled to refuse the inquiry because he could not guarantee delivery. One house reported the sale of 8000 coils of wire to Japan. Another sold Japan 4000 tons of light rails.

Among the sales to China reported were 1000 coils of galvanized wire and 1000 kegs of nails. China has been buying scrap heavily, one house selling 500 tons in one order. This house also sold China 150 tons of defective rods and 5000 boxes of tin plate. The Manila pipe inquiry has been heavy, one request being for 2000 tons.

South American inquiries have been normal but the deliveries have been giving considerable trouble. Wire and pipe appear chiefly in demand. One house sold South America 30,000 pieces of English pipe last week.

British Market Conditions Easier

Increasing Number of Inquiries for Semifinished Sent to United States, but Canadian Mills Are Getting Most of Business, Due to Better Exchange Rates—German Situation Improves and Mills and Mines Resume Operations

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent St., S. W. 1.,

Sterling—$3.92

LONDON, April 12.—A trifle easier situation in the British iron and steel market, has appeared due to prospective rather than present conditions. Interest in American supplies is growing daily, and large inquiries are going from Great Britain to the United States, especially for semifinished material. The cream of this business, however, is going to Canadian mills, owing to the better exchange situation. Inquiries have been sent to the United States for 5000 and 24,000 tons of billets, respectively. A European inquiry for 5000 tons of rails has been refused in Great Britain due to the sold up condition of the mills.

Pig iron is the tightest of all British iron and steel products. Unspecified tonnage on expiring contracts is promptly canceled. Three large furnaces in South Wales were blown in during the past week, making the total now blowing nearly 300. Foreign iron ores are cheaper, due to a lowering of freight rates. Exports of pig iron from the Middlesborough district in March amounted to 35,000 tons, compared with 42,000 tons in February.

The Iron Trade Review's correspondent at Düsseldorf wires that conditions in the Westphalian district are quieter. Steel works, including the Krupps plants, and also mines are resuming operations. German pig iron has advanced to 2288 marks, and hematite to 1750 marks.

Tin plate is easier, the quotation for the third quarter delivery being 70 shillings ($13.72).

Operations of Belgian plants have been curtailed through labor and transportation troubles in the Ruhr coal districts, and prices of Belgian material consequently have advanced. Belgian steel bars, plates and structural beams now are at 110 francs ($8.14), per 100 kilograms (220 pounds), while blooms are at 750 francs ($55.50) per metric ton.

British Buyers Turn More Insistently to America

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$3.82

BIRMINGHAM, Eng., March 26.—The continued steel famine is having its effect on prices, several advances having taken place. The quotation for billets at Birmingham yesterday was £26 ($98.32), a rise of about £2 ($7.64) in a week. Makers adopt a very firm attitude, and a quotation not accepted is immediately withdrawn. Some makers claim to have sold billets at £30 ($114.60) per ton. A large merchant inquired of 20 steelworks this week in different parts of the country and only two of the number were willing to quote. The Welsh steel works informed their customers that the £26 ($98.32) is applicable for business booked now to be delivered between this and next month. Future business will be subject to new quotations.

The resumption of work in South Wales has scarcely relieved the situation, the interrupted outflow of steel having not yet recovered its normal volume. Tin and sheet bars are being sold in Swansea at from £30 ($114.60) to £35 ($133.70) per ton, an advance of about £3 ($11.46) in a week. In Scotland on March 25 it was impossible to book steel bars under £30 ($114.60). The demand on the Clyde exceeds anything experienced in the history of the trade. The makers predict that £40 ($152.80) will be reached before prices reach their limit.

Buyers unable to place business are making inquiries abroad. An effort to obtain supplies in Lorraine failed, those mills being engaged in meeting continental needs. Efforts to reopen business with America have not been altogether abortive. Some steel has been bought for shipment from August to September at £27 ($102.14), c.i.f. Liverpool. One merchant has bought at £26 12s 6d ($100.71). There also is talk of a consignment of 5000 tons of American steel ingots seeking a customer at prices quite satisfactory for purchase in this country. The steady improvement in the rate of exchange is regarded as very favorable toward reopening business with America. At present the British makers are not troubling about American competition, having complete command of the market. Buyers are almost begging for the acceptance of their orders, prices being a secondary consideration. Numerous rerolling mills are either idle or partially so for want of steel, and therefore it is very difficult to obtain small bars and other material made from billets. Wire is at a premium, with makers turning to America.

The cablegram from THE IRON TRADE REVIEW showing the substantial rise in American ingot production during February had a good deal to do in stimulating the inquiries by British merchants and consumers for American supplies.

Sheets are very difficult to buy. No orders for galvanized sheets were accepted at Birmingham, the last offer being at £55 ($210.10). The Welsh quotation is £56 ($213.92). The advance this week is taking place despite a slight reduction in the values of spelter. Black sheets are selling at about £45 ($171.90), although prices appear to be spreading a good deal. The upward movement in tin plate has been counteracted a little by the fall in tin values. Quotations are about 3 shillings ($0.57) lower than they were last week, the selling figure being something like 77 shillings ($14.70).

A number of advances were made

Current Iron and Steel Prices of Europe

British Market

Corrected to Date by Cable

Domestic and Export. Gross Tons at Works

SEMIFINISHED STEEL

	£ s d	$
Billets, soft steel	26. 0.0	101.92
Sheet bars	33. 0.0	129.36

FINISHED STEEL

Steel bars, England, ¾ to 3 inch	28.10.0	111.72
Ship plates, England	23.10.0	92.12
Ship plates, Scotland	26.10.0	103.88
Beams, England	22.10.0	88.20
Beams, Scotland	23.10.0	92.12
Sheets, black, 24 gage	42. 0.0	164.64
Sheets, galvanized, 24 gage	56. 0.0	219.52
Rails, 60 lbs. and over	21. 5.0	83.30
Tin plate, base box, 108 lbs.	3.17.0	15.08

PIG IRON*

Hematite, East Coast Mixed Numbers	13. 0.0	50.96
Hematite, Scotch	10.10.0	41.16
Middlesborough Basic	10.17.6	42.63
Middlesborough No. 3	10. 0.0	39.20
No. 3Foundry, Derby, Leicester, Nottingham	10.13.0	41.75
No. 3 Foundry, Northamptonshire	9.17.6	38.71
No. 3 Foundry, Staffordshire	10.12.6	41.65
Scotch Foundry	11.10.0	45.08
Ferromanganese, 80 per cent.	32.10.0	127.40

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. Export prices generally are subject to free negotiation.

COKE

Yorkshire furnace	2.13.6	10.49
Yorkshire foundry	3. 6.0	12.94

French Market

Prices Last Reported

PIG IRON

	Francs per metric ton (2205 lbs.)	$
No. 1 Foundry, Longwy (silicon 3 per cent)	525	38.33
No. 2 Foundry, Longwy (silicon 2 per cent)	505	36.87
Hematite	700	51.10

COKE

French foundry	200	14.60
British foundry	500 to 550	36.50 to 40.15

ROLLED STEEL

Semifinished steel	825	$60.23
Beams and profiles	1045	76.29
Rails	1075	78.48
Plates	nominal	nominal

Pig iron quoted at furnace; coke, f.o.b. at ovens, or at French ports; rolled steel, at makers' works.

Belgian Market

Prices Last Reported

PIG IRON

	Francs per metric ton (2205 lbs.)	$
No. 1 Foundry (silicon 3 per cent)	625	46.25
English hematite (c.i.f. Antwerp)	600	44.40

FINISHED MATERIAL

	Francs per 100 kilos (220 lbs.)	$
Plates, 3 millimeters	165	12.21
Plates, 3 to 5 millimeters	145	10.73
Plates, over 5 millimeters	110	8.14
Beams	110	8.14
Sheets	165	12.21
Steel bars	110	8.14
Iron bars	140	10.36
Merchant iron	95	7.03

Pig iron quoted at Belgian furnaces, except English hematite; semifinished steel at works, and finished material delivered.

in prices quoted on the Birmingham exchange. Steel strip makers put up their prices £3 ($11.46) per ton, making the new price £33 10s ($127.97), with £34 10s ($131.79) for hoops. Mild steel bedstead angles have been further advanced £5 ($19.10), making the price £30 ($114.60), delivered in the district, with the usual extras. Mild steel wire of all descriptions was advanced £1 10s ($5.73), making the basis £42 ($160.44). Derbyshire billets were advanced £1 10s ($5.73), making the new figures £22 10s ($85.95) for soft and £23 10s ($89.77) for hard. Sales at such prices will be made only to regular customers.

It has not been considered necessary to revise Staffordshire iron lists, for the reason that all the list prices are entirely disregarded as a basis for business, with the single exception of marked bars on which quotations are firm. The quoted price for unmarked bars, £26 10s ($100.23), is £3 ($11.46) below the selling figure, and the same may be said of skelp, quoted at £27 10s ($104.05) and easily selling at £30 ($114.60) as a minimum.

The freight situation is a little easier, but east coast hematite continues scarce and expensive. Derbyshire pig irons have been advanced 2 shillings 6 pence (48 cents) a ton on most brands. All the blast furnaces are short of coke.

French Prices Reflect Labor-Rail Tie-up

European Staff Correspondence

Franc—$0.073

PARIS, March 25.—The recent railway strike, with the attendant congestion in transportation, and the miners' strike in the Loire district and northern France, have affected current prices of iron and steel products. French foundry coke is now generally selling at 200 francs ($14.60) per ton, ovens, an increase of 60 francs ($4.38) over the price two weeks ago. English coke which is consumed by the foundries of the lower Seine is held at 500 to 550 francs ($36.50 to $40.15), a ton, delivered at French port. The wide variation in price is due in a measure to the grade of the coke.

No. 1 foundry pig iron (silicon 3 per cent) is quoted at 525 francs ($38.33), although 475 to 480 francs ($34.68 to $35.04) has been accepted for March deliveries. Blast furnaces are loath to book any orders without reservation as to price revision at time of delivery.

Semifinished and finished products also are showing the same upward tendency. Rolled steel has advanced 15 to 25 francs ($1.10 to $1.83) per 100 kilos (220 pounds). A minimum of 115 to 120 francs ($8.40 to $8.76) per 100 kilos is foreseen for next month on all rolled steel products. Due to the lack of coal and coke, many plants are running on but part time, with the consequence that production costs have automatically risen to a point well above full operation costs.

Only within the next fortnight can an estimate be made as to the business in the immediate future. It is interesting to note that the Inspection des Forges, a semigovernmental agency to dispose of government stocks, recently offered the following

in the Lyonnais region at the prices quoted:

Plates	Francs 100 kilos	$
10 millimeters	71	5.18
8 millimeters	72	5.26
7 millimeters	81	5.91
6 millimeters	83	6.05

In view of the rising market these are considered exceptionally favorable prices. The Association of Steel Founders refuses to accept orders for castings for future delivery without a clause providing for a price revision, and suggests an increase of 2 francs (14.6 cents) per 100 kilos for each 10-franc (73-cent) rise per ton of hematite ore, with an additional 1 franc (7.3 cents) per 100 kilos for each 1-franc rise in the price of coke. In a general way this gives a formula on which estimates can be based, but there is no more assurance of arriving at a fixed price for a finished commodity than there is in the possibility of guessing the ruling price of hematite or coke in the next 30 or 60 days.

A comparison of quotations at the beginning of September, 1919, and the middle of March, 1920, shows an average advance of over 60 cents, due primarily to the application of the 8-hour day, the increased cost of coal and transportation.

Belgian Prices Forecast Sales to France

European Staff Correspondence

Franc—$0.074

BRUSSELS, Belgium, March 25.—Prices of Belgian iron and steel continue strong. Merchant iron has reached 95 francs ($7.03) per 100 kilos (220 pounds), iron bars 140 francs ($10.36). No. 1 foundry iron (silicon 3 per cent) is quoted at 625 francs ($46.25), furnace. English hematite has sold in Belgium at 600 francs ($44.40), which is cheaper than Belgium furnaces can produce at present. Plates of 3 to 5 millimeters are quoted at 120 to 145 francs ($8.88 to $10.73) per 100 kilos and sheets of 1 millimeter at 105 francs ($12.21). These are but reflections of the ruling prices in France, but Belgium is nearing the time when she will be able to make a market price which, if customs dues do not prevent, will secure business in France.

Since the dissolving of the Comptoir d'Aciers Belges, the Belgium steel consortium, in December, there has been no ruling body in this country which has sought to regulate distribution and prices of steel products. As already referred in cable dispatches to THE IRON TRADE REVIEW, a new groupment has come into being, the principal adherents being Cockerill's, La Providence, Ougree-Maribaye, Athus-Grivegree, Boel, Claberg, l'Esperance, Longodoz, Thy-le-Chateau, Officine Metallurgique de Hainaut, Monceau-St. Fiacre, Angleur and Sambre et Moselle.

Finished and semi-finished products of all these plants will be offered purchasers at identical prices, the new association serving merely as intermediary between consumers and producers.

Belgium is certain to encounter competition from other countries, and sees in close co-operation the only method by which its own plants, now fast approaching normal production, may be assured steady production. The Charleroi district is the hub of an industrial iron and steel center which has nearly 500,000 persons dependent on the industry for their livelihood. War damages in this district alone are estimated to have been over 7,000,000,000 francs. More than 57,000 tons of machinery were destroyed or taken away.

Coal pits actually in operation number 32 at Charleroi, 20 at Mons, 8 in the Centre, 11 at Namur, and 40 at Liege. In 1919 they produced over 18,000,000 tons, but 5,000,000 tons less than the entire production before the war.

The plant of La Providence at Charleroi is producing 12,000 tons of pig iron per month and a like tonnage of rails. By summer, the director announces, a production of fully 30,000 tons of steel per month may be looked for. Two thousand workmen are now employed as compared with 3000 before the war.

Domestic Needs First, Rule in Germany

Special Correspondence

DUSSELDORF, Germany, March 29.—Although at present revolutionary disturbances in Germany have caused the government practically to cease to function, nevertheless plans are going forward for the control of export prices under the auspices of the *Preissprufungstelle*, and it is now stated that the export of iron and steel commodities is to be so regulated that the most urgent domestic demands will be taken care of first before any tonnage is released for export. In view of the fact that almost the whole of the Westphalian iron and steel district in Germany is paralyzed by bolshevik activities it is not seen how, if the regulations are carried out, there will be any German steel available for export indefinitely.

During March the price of iron ores remained unchanged, the controlled price for raw red ore being 199.10 marks per metric ton, for manganese ore 200.50 marks, and for roasted iron ore 208.40. The Rhenish-Westphalian Coal syndicate has fixed the following selling prices for coke, including the coal tax but excluding the turnover tax, the quotation being per 100 kilograms (220 pounds): No. 1 furnace coke, 62.70 marks; No. 2 furnace coke, 62.30 marks; No. 3 furnace coke, 61.90 marks; foundry coke, 70.50, and No. 1 nut coke, 82.40 marks.

There is some slight activity in puddled iron manufacture in Germany. Just prior to the Kapp-Luttwitz revolution the Rhenish-Westphalian Wrought Iron association advanced its prices of puddled iron products 1050 marks per metric ton, bringing ordinary bars up to 3270 marks, and rivet and chain iron up to 34.50 marks, including the coal tax.

Just prior to the recent revolutionary disturbances also considerable renewed activity was evident among the manufacturers of agricultural machinery in Germany. A number of export orders were received and exports were going out principally to Holland, Denmark Poland and Hungary. At present the only agricultural implement plant in Germany in a satisfactory condition is that owned by the International Harvester Co. of America. Fortunately this plant is at Neuss on the left bank of the Rhine, just within the occupied territory.

Electrochemists Meet in Boston

Meetings of American Institute of Electrical Engineers and American Electrochemical Society in Boston Reflect Rapid Development of Electric Furnace Industry—Electrochemists to Take Referendum on Metric System

PRACTICALLY all phases of electric furnace operation and maintenance were discussed in detail at the joint meetings of the American Institute of Electrical Engineers and the American Electrochemical society held in Boston last week. More than 50 technical papers were presented and a number of inspection trips to manufacturing plants in and near Boston were made. More than 200 engineers and metallurgists attended the meetings.

At the opening session Thursday, April 8, after electing the officers named on the opposite page, the members of the American Electrochemical society considered the question of taking action on the proposed metric system. The directors of the society, who had been asked to recommend approval of the system, declined to do so and presented the matter to the meeting without recommendation. The members promptly ordered that the question be put to a referendum vote of the entire association membership by mail.

The program of the American Institute of Electrical Engineers and the American Electrochemical society included two technical sessions on Thursday, April 8, a session on electrically produced alloys, Friday morning, a session on power for electrochemical purposes, Friday evening, and a session on the metallurgy of the electric furnace Saturday morning. The session devoted to the manufacture of ferroalloys was unusually complete, the program including papers dealing with practically all angles of the ferroalloy industry in the United States.

Electric Furnace Aids Alloy Industry

DISCUSSION of the future position of the electric furnace in the steel industry was the outstanding feature of the joint meetings of electrical and chemical engineers. On Friday the American Electrochemical society held a joint session with the American Institute of Electrical Engineers at which time papers under the general heading "Electrically Produced Alloys" were presented. A plea for gathering and publishing existing data on standard alloys was made by H. E. Howe, vice chairman of the division of research extension of the National Research council. Such compilation of data should include the uses, composition, physical properties, and variation of physical properties with differences in composition for all standard alloys. In addition to this, continued research in an attempt to learn what takes place in an alloy under various treatment is important according to Mr. Howe, for it is only with this knowledge that control of changes can be exercised to meet desired specifications. The formation of an alloys research association is being considered to act as a clearing house for individual investigation.

A paper on recent developments in the ferroalloy industry, by Robert J. Anderson, United States bureau of mines, Pittsburgh, which appears elsewhere in this issue, introduced an interesting discussion on the making of ferroalloys. The future of this industry is a matter of international importance, and is dependent upon the steel market and the general industrial situation.

The demands for quality in steel are continually growing more exacting and it is to ferroalloys that steelmakers turn in order to meet these requirements. This means development of the manufacture of ferroalloys and means also the development of the electric furnace. C. B. Gibson of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., presented a paper on the manufacture of ferroalloys in the electric furnace. He outlined the limitations of the blast furnace and crucible methods of manufacture and pointed out how these limitations are overcome in the electric method. Ferroalloys, he said, are used by the steelmaker for two purposes; namely, as a cleansing and deoxidating agent, and as a means of introducing certain physical properties into the steel, depending upon the alloy used. Ferromanganese, for instance, when added in amounts of 12 to 14 per cent makes steel hard and tough. It is the most extensively produced of any of the alloys. Mr. Gibson took up in succession each of the more common alloys and gave a brief description of their effects upon steel.

A large part of the paper was given up to a discussion of the design of electric furnaces. In the proper design there must be a correct relation of the essential parts of the furnace; the character of the charge and the magnitude of the heating elements must be carefully considered; and the size and shape of shell, size and relative location of electrode and power output all influence the results. Recent development has improved the automatic control of electrodes, eliminating over travel and injurious arcing. In planning the improvement of operating conditions of existing furnaces it is important to understand the effect of changing frequency. Whereas a 10,000-horsepower, 60-cycle furnace is about the limiting size for a well designed unit, 22,000 horsepower is the corresponding size for a 25-cycle furnace.

The manufacture of high-speed steel in the electric furnace was the subject of a paper by Roy C. McKenna, president, Vanadium-Alloys Steel Co., Latrobe, Pa. In this he recounted the advantages from the manufacturers' standpoint of the electric furnace process over any other way of making high-speed tool steel, and then discussed the various important points in electric furnace practice. High-speed steel, generally, contains from 16 to 20 per cent tungsten, from 3 to 5 per cent

chromium and about 1 per cent vanadium. The benefit of adding vanadium is not disputed but the relatively low specific gravity and relatively high melting point of ferrovanadium make it difficult to keep its per cent within even a moderate range by the crucible process. The electric furnace overcomes this. One of the great advantages of the electric furnace is its capability of producing steel low in phosphorus and sulphur. Mr. McKenna gives the power consumption for a 3-ton heat of high-speed steel in a heroult furnace as 1000 kilowatt hours.

The process of obtaining nitric acid from the air by means of the silent electric discharge at high voltage was covered in detail by Prof. C. F. Harding of Purdue university, Lafayette, Ind. The importance of investigation along this line was brought out by the war.

The joint technical session was continued Friday evening with a symposium on power for electrochemical purposes. H. L. Hess of the Hess Steel Corp., Baltimore, in a paper on the electric furnace and the central station, reviewed the difficulties commonly met with in connection with the great load fluctuations of earlier types of furnaces. The growing electric furnace industry is of such importance to the central station owner that he must make the problems of load fluctuation his problems and must work with the furnace manufacturer and the furnace operator toward the elimination of the objectionable features. In order to compete with others in his business the electric furnace owner must get his power at the lowest possible cost and to deliver power economically the central station man must have as nearly a uniform load as possible. This same topic came up at the Saturday morning session and the question of using external reactances for correcting fluctuations was discussed at some length. Mr. Hess devoted much attention to the operation of the electrical furnace from the metallurgist's point of view. Correctly operated, the electric furnace is a large crucible, heated by pure heat from within, rather than a contaminated heat from without, with all the added advantages of positive heat control and to a large extent, atmospheric control as well. Open-hearth electric steel, which consists of metal taken from the open-hearth furnace and charged hot into an electric furnace for further refining fills the want for high quality steel at a price consistent with competitive requirements. Such steel does not, however, compare with the higher grades of cold melt electric steel. The discussion of Mr. Hess's paper centered about the future use of the electric furnace in conjunction with the converter and open hearth. The statement was made that eventually all steel will be put in electric furnaces for a last refinement. This statement was loudly applauded by all furnace manufacturers present.

Operating Furnaces in Parallel

In a paper on power problems from the standpoint of the furnace operator, Wallace G. Berlin described the use of two furnaces in parallel so as to reduce the "demand" power and to enable the use of off-peak power. Incidental to the general discussion of this paper a concise and comprehensive description of the usual practice in making steel in the arc type of furnace was given. As soon as a heat is poured out of the furnace the banks are patched with dolomite and the next charge, consisting of heavy melting scrap, is introduced. The electrodes are then lowered and the current turned on at full capacity of the transformers. In about 30 minutes a pool of molten metal is formed under each electrode. During this period the power fluctuates heavily. Lime is then added and the power imput settles down to a steady value. In about 1 hour and 45 minutes the charge is melted and carbon determined. The bath is then "ored down" or "pigged up" until the proper composition is reached. The slag is then drawn off and a new slag made, of lime and fluor spar. After coking over with ground coke the desulphurizing and deoxidizing start and in 20 minutes a white slag is formed which completely deoxidizes the steel in about 30 minutes. Alloy additions are then made and the heat brought up to a pouring temperature. From this it may be seen that by operating two or more furnaces in parallel with about an hour's difference between one and the next, the current fluctuations in one furnace will occur at the time of steady load of another and so the per cent of fluctuation of the total load will be greatly reduced.

The Saturday morning session was held in the new lecture hall at Harvard university and was devoted almost exclusively to a symposium on electric furnaces. Joseph W. Richards presented an interesting paper on the Soderberg self-baking continuous electrode. This electrode embodies the idea of feeding continuously unbaked electrode mixture to the furnace, the mass being baked by the heat of the furnace in which it is being used, and the apparatus being so arranged that the operation is practically continuous throughout the life of the furnace.

The manufacture of pig iron in the electric furnace by the recarburizing fusion of steel scrap was the subject of a paper by C. A. Keller.

A description of the various types of brass furnaces and the evolution of these down to the present day practice was given by H. M. St. John of the Detroit Electric Furnace Co. Other papers and general discussion of this session predicted the future importance of the electric furnace in iron and steel metallurgy.

On Friday afternoon nearly all those attending the conventions went in a body to visit the Lynn plant of the General Electric Co. This trip was in charge of the General Electric Co. which provided special trolley cars, a printed description of the trip and a host of guides from the ranks of its technical staff.

The Saturday session was followed by an inspection of the Harvard university chemical research laboratories and then a lunch at the Harvard Union. In the afternoon many of the visitors took advantage of the invitation of the Huff Electrostatic Separator Co., Arlington, to inspect the company's plant.

Other features of entertainment during the conventions included a smoker at the Arthur D. Little, Inc., laboratories in Cambridge and an informal subscription dinner at the Copley Plaza hotel held by the American Institute of Electrical Engineers, but open to the members of other societies.

Elect Officers

DURING the convention, the American Electrochemical society elected the following officers for the current year:

President

WALTER S. LANDIS,
Chief technologist, American Cyanamid Co., New York

Vice Presidents

DR. JOHN A. MATHEWS,
Vice President Crucible Steel Co. of America, Pittsburgh

L. E. SAUNDERS,
Vice President, Norton Co., Worcester, Mass.

A. T. HINCKLEY,
Chemist, National Carbon Co., Niagara Falls, N. Y.

An insurance policy for $500 will be given without cost to every employe of the Westinghouse Electric & Manufacturing Co. who has been in the service of the company for a period of six months or more, according to a statement made by one of the officials of the company. The plan became effective March 1. After April 1, employes may also increase the value of their policies to amounts varying from $1000 to $2000, depending on their length of service and continuity of savings.

Make Progress in Ferroalloys-I

Rapid Advance in Metallurgy of Ferroalloys in Past Five Years Has Been Marked by Departures from Prewar Practice—Electric Furnace Is Important Factor in Development of Alloy Industry

BY ROBERT J. ANDERSON

RECENT progress in the metallurgy of ferroalloys has been characterized by some important departures from prewar standard practice in this country, as well as by numerous technical and scientific investigations looking to the more economical manufacture and utilization of steelmaking alloys. Much attention has been given to mining and concentration problems for the purpose of securing better recoveries and preventing waste, and these investigations should prove to be of substantial value to the industry and the country.

The ferroalloy industry is relatively old, having been built up with the steel industry, but the significant metallurgical advances have come since 1899 with the employment of the electric furnace for the manufacture of all kinds of ferroalloys. Ferromanganese, spiegeleisen and low-grade (bessemer) ferrosilicon are still produced mainly in the blast furnace, but crucible practice for the manufacture of other principal ferroalloys has vanished. At the present time, ferrochromium, ferrotungsten, ferrotitanium, ferromolybdenum and ferrouranium are made principally in the electric furnace and a subordinate amount of some of these by the thermit process; ferrovanadium is made largely by a modification of the thermit process in an open-hearth furnace, but the electric furnace has been gaining ground for ferrovanadium reduction.

Ferromanganese and Spiegeleisen

A great deal of attention was given to manganese during the war, and several metallurgical changes in practice were put into effect. The standard contents of ferromanganese (78-82 per cent) and of spiegeleisen (18-22 per cent) were lowered to 70 and 16 per cent manganese, respectively, so as to make practical the utilization of lean domestic ores, and to conserve manganese. At the same time, two other alloys, silico-manganese and silico-spiegel, came into some prominence. In the conservation efforts carried out during the war, it was shown that the lower grades of ferromanganese and spiegeleisen could be satisfactorily employed in steelmaking, but the personal prejudice of most steel makers is against such alloys. Immediately after the restrictions were removed at the close of the war, production of the lower grade alloys ceased, and the former standard grades are now made exclusively. Efforts were also made to substitute spiegeleisen for ferromanganese for the higher carbon steels; this was not a metallurgical advance, but rather a retrogression to the practice of the bessemer rail mills, using cupolas to melt the spiegeleisen. An investigation carried out with the idea of conserving manganese in open-hearth practice and utilizing alloys other than ferromanganese, pointed out metallurgical advances in three directions: The use of a molten spiegel mixture for deoxidation and recarburization; the practice of melting and refining the steel bath so as to insure a relatively high residual content of manganese; and the use of manganese alloys containing silicon (silico-manganese). As has been mentioned, the use of silico-manganese and silico-spiegel was extended somewhat. Difficulty in obtaining sufficient supplies of ore suitable for the production of ferromanganese led to active consideration and large scale experiments in the smelting of manganese-lean and siliceous ores in the electric furnace for making so-called intermediate alloys such as the following.

Alloy	Approximate Chemical Composition, Per Cent Mn	Fe	Si	C
Silico-manganese	55-70	20-5	25	0.35
Silico-spiegel	20-50	67-43	4-10	1.5-3.5

Alloys like the above can be made readily in the electric furnace, but the extent to which they can be employed depends largely upon the prejudice of the American steelmaker rather than upon metallurgical considerations. It has been demonstrated, however, that large tonnages of silico-manganese can be used in the United States in the manufacture of steels to which both ferromanganese and ferrosilicon must normally be added, and sufficient evidence is at hand (based on foreign practice as well as large scale experiments in this country) to indicate that the use of silico-manganese is metallurgically sound and desirable. Prior to the war, practically all the ferromanganese made in the United States and elsewhere was a blast furnace product, and a metallurgical development of importance has been the commercial electric furnace manufacture of this alloy.

Making Ferromanganese

Manganese recovery in the manufacture of silico-manganese by the electric furnace is, however, normally about 95 per cent because of the absence of slag, and the direct manufacture of silico-manganese is a marked advance over the earlier method employed of mixing molten ferromanganese and ferrosilicon to form the desired alloy. Ordinarily, blast furnaces making ferromanganese can operate economically on ores containing not much less than 40 per cent, or 35 per cent at least, manganese nor more than 12 per cent silicon, but the electric smelting of both low-grade domestic ores and manganiferous slags has been shown to be metallurgically feasible. It is scarcely

Electric Furnace Aid to Alloy Industry

IN the accompanying article which was presented at the thirty-seventh general meeting of the American Electro Chemical society at Boston, April 8-10, 1920, the author, Robert J. Anderson, metallurgist, United States bureau of mines, Pittsburgh, discusses the conditions in the ferroalloy industry in the United States, particularly during the last five years, and outlines the progress made in the metallurgy of ferroalloys. In the second part of the paper which will be presented in next week's issue the author discusses the present status of the electric furnace production of ferroalloys in the United States, mentions the factors affecting domestic ferroalloy industry, such as the supply of metallurgical ores, electric power, and location of plants, and the trade situation.

profitable to attempt to so smelt such ores in normal times and prices.

From the standpoint of tonnage produced ferrosilicon is the most extensively used of all the ferroalloys made in the electric furnace. Blast furnace ferrosilicon, socalled bessemer grade, had been manufactured for many years in the United States, but there were only one or two producers of 50 per cent electric furnace ferrosilicon in this country prior to 1914. Owing to the large demand in the steel industry, the number of producers was increased to about 15 in 1918, but during the period of liquidation and collapse in 1919 a number of the plants have been dismantled.

The main reason for the slow development of electric furnace manufacture of ferrosilicon in the United States had been the cost of power. Power consumption is normally very heavy, and although the cost of raw materials is low, it had previously been found cheaper to import 50 per cent alloy, as well as the higher grades. Steadily increasing open-hearth capacity prior to the war caused a regular increased consumption of 50 per cent ferrosilicon, but this was not reflected in further expansion of the domestic output to any extent. The great expansion in the domestic output of ferrosilicons of all grades, as well as that of Canada, England and France, was the result of the enormous quantities of shell and munitions steel made. These steels run fairly high in silicon.

A number of new electric furnace plants were installed during the period 1914-1918, most of the expansion coming during the first three years of the war, with Canada taking an advanced position. The higher grades of ferrosilicon, containing 75 and 90 per cent silicon, found increased application in the manufacture of high silicon electrical steels, and the manufacture of these alloys was undertaken by steel companies for their own consumption.

Make Progress in Ferrochromium

There were only two domestic makers of ferrochromium prior to the war, but the number of producers in 1918 was about 10, and the capacity was about 25,000 tons per year. The situation in ferrochromium has been somewhat analogous to that in ferrotungsten, but the metallurgical advances in ferrochromium have been more noteworthy in the past five years. Metallurgical progress has been made in the direct production of low-carbon ferrochromium in the electric furnace, in the refining of high carbon alloys, and in smelting lean domestic ores. Keeney's notable experiments on the smelting of low grade ores and chromium slags have contributed materially to recent metallurgical progress. It has now been shown that good recoveries of chromium may be expected when smelting lean ores provided the carbon in the resultant alloy is allowed to run high enough (7 per cent). From a metallurgical standpoint, entirely satisfactory results have been obtained from high grade domestic ores in smelting all grades of ferrochromium.

During the war, most of the ferrochromium used in the steel industry was for the manufacture of chromium-nickel and chromium-vanadium steels, either directly or indirectly for government requirements, but with the withdrawal of the war demand some of the new companies, which made ferrochromium, have been forced to suspend operations temporarily or completely. The alloy containing 6 to 8 per cent carbon and 60 to 70 per cent chromium is a standard grade, but some steelmakers prefer high-tenor alloys with less carbon.

Ferrotungsten is Now Domestic Product

Prior to 1914, nearly all of the tungsten powder and ferrotungsten used in the United States for the manufacture of high-speed steel was imported from Germany, but during the war the United States became a large producer and exporter of ferrotungsten and metallic tungsten. The metallurgical importance of tungsten is due practically entirely to its use in the manufacture of high-speed steel, and about 95 per cent of all the tungsten produced or imported, ultimately finds its way into special steels.

The growth of the manufacture of ferrotungsten and tungsten powder in the United States is best shown by the following: Prior to 1914, practically no ferrotungsten was made here, although at the same time Germany was importing ores from this country and shipping ferrotungsten for American consumption. At the close of 1918, there were about 20 domestic makers of ferrotungsten and tungsten powder, but some of these have been obliged to cease operations in 1919. Normal consumption of 60 per cent WO_3 concentrates for the manufacture of ferrotungsten and tungsten powder is now rated at about 7500 tons per year by a leading maker.

Naturally, during the war the demand for tungsten for high-speed steel to be used in machining shells, munitions, and machinery was enormous, but in normal times the demand had expanded heavily with the development of the automobile. A further increased demand is looked for in connection with tractor development, which promises to be very large, and the demand for high-speed steel is certain to advance. The metallurgical advances in the manufacture of ferrotungsten have been few in recent years, and the main technical progress in the tungsten industry of the United States has been in connection with milling and concentration. At the height of the tungsten ore production, the milling of ores in Boulder, Colo., district had reached the highest development in the world.

Formerly, tungsten powder was used almost entirely for fixed additions to steel, but the powder has now been replaced to a considerable extent by low-carbon 80 per cent ferrotungsten. At the present time, in the manufacture of high-speed steel about 50 per cent of the tungsten used is in the form of ferrotungsten, the remainder being tungsten powder. Metallurgically, there should be no particular advantage in either, but if the ferrotungsten is not homogeneous variations in the tungsten content of the steel may occur. On the other hand, loss by oxidation in making fixed additions to steel are claimed to be less when ferrotungsten is employed than tungsten powder. The use of ferrotungsten is growing in favor. No serious difficulties are met with in the reduction of ferrotungsten in the electric furnace; it is one of the easiest alloys to reduce and does not so readily oxidize or form carbides as chromium and uranium. No progress has been made in tapping high-grade ferrotungsten from the electric furnace, and the alloy is still made principally in knock-down furnaces. Lower grade ferrotungsten can be tapped, but it is not practice to do so. The ability of domestic makers to turn out a high-tenor, uniform ferrotungsten has been demonstrated, and the use of tungsten powder is likely to decrease, more ferrotungsten being made from year to year. Some ferrotungsten is still made by the reduction of tungsten concentrates in the crucible with carbon, but the bulk of the output in the United States is made in the electric furnace by reduction with coke or other carbon.

Uses of Ferrovanadium

About 75 per cent of the ferrovanadium made in the United States is manufactured by the thermit process, or by a modification of the thermit process in the open-hearth furnace using metallic aluminum as the re-

ducing agent. The remainder of the ferrovanadium is made in the electric furnace using 90 per cent silicon as the reducing agent. Consequently, the price of ferrovanadium is affected largely by the fluctuations in the aluminum market and to a less extent by the price of silicon. Reduction of vanadium oxide or vanadate of iron by carbon in the electric furnace has been generally abandoned because of the difficulty in holding carbon low in the resultant ferrovanadium, and this element is highly objectionable to steelmakers.

In connection with the recent reorganization of the American Vanadium Co., plans called for an electric furnace installation for working over the large slag dumps at Bridgeville, Pa., for the purpose of recovering the vanadium lost by the earlier operations. Additional progress has been made in metallurgical investigations looking to the utilization of domestic ores, particularly the vanadinites and complex ores of New Mexico and Arizona. With the threatened decline in the output of the Peruvian mines, the domestic vanadium bearing minerals of little importance at present may become commercial ores of vanadium.

A noteworthy change in recent years has been the introduction of vanadium into high-speed steels, particularly all high tungsten-chromium and molybdenum-chromium steels. The growth of the ferrovanadium branch of the ferroalloy industry in this country has not been so marked in the last five years as was the case with ferrosilicon, ferrotungsten and ferrochromium; however, the United States was the largest maker of ferrovanadium both before and during the war, and the domestic output increased considerably during the war period. There were two or three domestic producers of ferrovanadium prior to 1914 and six or seven at the close of 1918.

Ferrotitanium in the United States

Alloys of iron and titanium were developed for use in the metallurgy of steel after the introduction of the electric furnace, and at the present time the greater part of the ferrotitanium made in the United States is an electric furnace product. Some carbon-free ferrotitanium is made by the thermit process, but this alloy also contains varying amounts of aluminum. There are still two distinct kinds of ferrotitanium alloys manufactured, one called ferrocarbon-titanium, containing 15 to 18 per cent titanium and about 6 per cent carbon and the other a carbon-free product, containing about 25 per cent titanium. The former is made in the electric furnace and the latter by the thermit process.

The use of titanium-treated rails fell off markedly for several years prior to 1914 because of the ascendency of the open-hearth process in making rail steel; consequently with the decline of bessemer tonnage of rails, the amount of ferrotitanium alloys used in their manufacture decreased rapidly. This followed because it was thought that the supposed superiority of the open-hearth rail would obviate the use of titanium in rail steel, but further experience indicated that the use of ferrotitanium alloys was also desirable for open-hearth rail and other steels so that titanium is again used in large amounts for scavenging steel. About 2,500,000 tons of steel were treated with ferrotitanium alloys in 1918, and the metallurgical value of additions of titanium has been shown to be of distinct importance in treating all kinds of steels.

During the war, in connection with conservation of manganese, numerous experiments were carried out for the purpose of substituting ferrotitanium alloys for ferromanganese either in whole or in part; partial substitution of ferrotitanium for ferromanganese has been successfully effected, and this practice will probably continue to increase in view of the results obtained on a large scale. One steel plant has been able to reduce the usual amount of ferromanganese about 50 per cent by addition of ferrotitanium in the ladle. Exports of ferrotitanium alloys have continued to grow, and the United States continues to occupy a leading position in the titanium branch of the ferroalloy industry.

The development of molybdenum steels has been the result of European investigations principally, and further application of these steels is looked for. Considerable furore has been raised recently over the molybdenum steel developed by Dr. Arnold in England, but this development, in fact, dates back to 1899 and essentially calls for the use of vanadium and the substitution of molybdenum for tungsten. Much of the actual development in molybdenum steels during the war was closely connected with ordnance matters both here and abroad, and the results of experiments are just now coming out. Among other things, the development of complex molybdenum steels for forgings is noted, as well as use of calcium molybdate for making fixed additions of molybdenum to steels. There is an ample supply of workable ore in the United States, notably the deposit at Climax, Colo., and this country should have no difficulty in supplying its own internal requirements of ferromolybdenum.

This is one of the more recent ferroalloys to be suggested and used in the metallurgy of steel, particularly for fixed additions in the manufacture of so-called uranium tool steels. All of the ferrouranium made in the United States for commercial sale is obtained by reduction of by-products derived from the carnotite ores of Colorado, secured principally by the method of extraction employed by the National Radium institute. The important metallurgical advances in ferrouranium and uranium steels have dated from the original work of the United States bureau of mines in cooperation with the institute and a private steel company; ferrouranium was developed principally to secure an outlet for the large amounts of sodium uranate, $Na_2U_2O_7$, which accumulated as a by-product from radium production. Sodium uranate is converted into the black oxide of uranium by reduction with carbonaceous material on fusion with sodium-chloride, and the resulting uranium oxide, UO_2, is the raw material for the electric furnace production of ferrouranium.

Minor and Complex Ferroalloys

Numerous alloys of iron with other elements have been suggested and used in the metallurgy of steel for various purposes, including ferroaluminum, ferroboron, ferrocerium, ferrocobalt, ferronickel, ferrophosphorus, ferrotantalum, ferrozinc, ferrozirconium, ferrosilico-aluminum, ferromanganese-aluminum, ferrosilico-manganese-aluminum, ferrocalcium-silicide, ferrotitanium-aluminum-silicide, and some others. Ferroaluminum is not being made, but an important metallurgical possibility for its manufacture from ferruginous bauxite in the electric furnace is suggested by J. W. Richards. It was formerly made as a regular alloy for the final deoxidation of steel, but its use ceased when commercial aluminum became relatively inexpensive. As an electric furnace alloy made from bauxite, it probably can be made to sell at a less relative cost than aluminum.

The electric furnace work to date on ferroboron has been largely experimental. Ferroboron has been made for determining the effect of additions of boron to steel, but no alloy maker in the United States has yet undertaken its manufacture on a commercial scale. The alloy is made in the electric furnace by the direct reduction of colemanite with iron ore

(*Continued on page* 1127)

Fig. 1—Due to hot top molds, slow cooling and gradual reheating, ingots having a close grain structure and free from pipes, seams, etc., are produced

Rolling Bars in Merchant Sizes

Tool Steel Plant in New York Installs Two New Bar Mills — Reduction Gear Set Serving the 10-inch Mill Built With Three Individual Coupling Flanges to Permit a Quick Change of Roll Speeds

BY JOHN D. KNOX

AMONG the various companies to crease their manufacturing facilities recently in order to better meet the growing demand for high grade tool and alloy steels has been the Hammond Steel Co., Syracuse, N. Y.

This company was established in 1911, the equipment then consisting of a single 2-ton steam hammer, a heating furnace, with just enough of a building over it to keep out the weather. Through care and persistent methods, this small beginning was made a stepping stone to the successful and steady enlargement of the business and plant. As conditions warranted the officials placed their plant on a greater productive basis, and by the early part of 1919, the plant covered eight of the original 15 acres of ground purchased. A description of this equipment as it then existed was published in July 17, 1919 issue of THE IRON TRADE REVIEW.

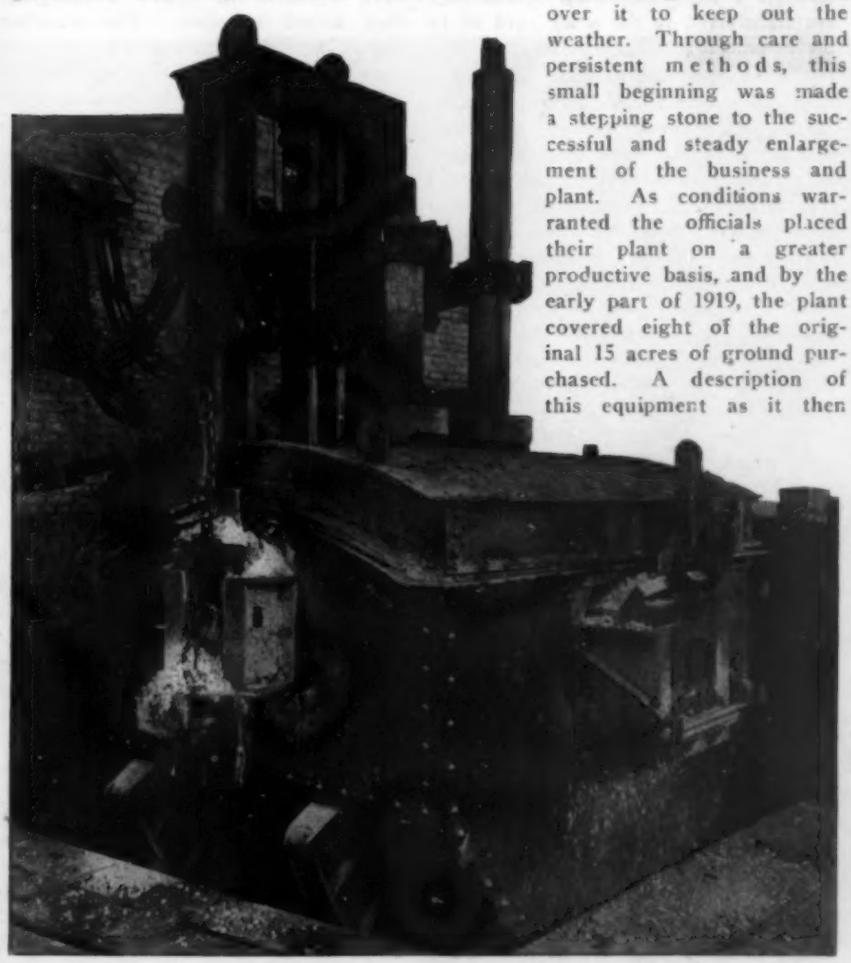


FIG. 2—TO SUPPLY THE NEW MERCHANT BAR MILLS WITH STEEL, AN ADDITIONAL ELECTRIC FURNACE OF THE GREAVES-ETCHELLS TYPE WAS INSTALLED IN THE MELTING DEPARTMENT

During 1919 the company increased its steelmaking capacity and undertook the erection of modern rolling mills, including cogging and finishing mills. To supply these mills with tool and alloy steel, additional electric furnaces of the Greaves-Etchells type were installed. In order to take care of the increased power requirements, the company placed its entire electrical equipment on 25-cycle transformers. The current is brought from Niagara Falls, N. Y., at 11,000 volts and is stepped down to 440 volts by General Electric Co. transformers. Two 150-kilowatt generator sets were also installed to take care of the operation of crane press manipulators and other equipment where direct current connection is advantageous.

Particular care is exercised in the handling of the steel from the time it is poured until the time it is shipped from the plant in the finished state. Of special importance in this practice is the use of patented hot top bricks, by the use of which ingots unusually free from pipe and shrinkage are produced. After stripping, the ingots are placed in cooling pits equipped with mechanically operated covers. The rate of cooling is regulated in accordance with the grade of steel and size of the ingot.

Ingots Broken Down Under Press

Ingots, which are to be formed either by the forging or rolling processes into the various products manufactured by this company, are converted either into billets or ingots of small size under a 1000-ton hydraulic press. By this method of conversion it is claimed the

FIG. 3—FLATS IN ALL SIZES AND ROUNDS FROM ¼ TO 2⅞ INCHES ARE ROLLED ON THE 10-INCH MILL, WHICH INCLUDES FIVE STANDS OF ROLLS

steel is kneaded thoroughly and is left with a structure seldom obtained by other methods of cogging. Prior to breaking down, the ingots are charged cold into a practically cold furnace and are heated slowly for the purpose of preventing any uneven expansion and consequently internal bursts. The press is served by a large electrically driven floor-type manipulator, which during the war was used entirely for manipulating heavy gun forgings. The press is supplied with steam from two 125-horsepower waste heat boilers made by the Wickes Boiler Co., Saginaw, Mich. The waste heat comes from the large heating furnaces which supply ingots for the press.

The hydraulic press and electric manipulator also aid materially in the production of special forged alloy steel shafts, pinions and other heavy forged parts. For rough turning forgings, the company has recently installed heavy duty all geared head lathes, including a 42-inch x 30-foot extra heavy pattern machine built by the Bridgeford Machine Tool Co., Rochester, N. Y.

Removing Surface Defects

After the ingots are pressed or hammered and cogged into the required size, the resultant billets or blooms are transferred to the chipping and grinding departments where any surface imperfections, such as scale pits, seams, etc., are removed by use of air operated chipping hammers and electrically operated grinding wheels. The billets also are pickled at this point and go through a rigid inspection before they are transferred to the stock yard or to the hammers for the final operations.

The company has recently installed a monorail system for handling and transferring the billets, blooms, coal and finished products from one department to another. Formerly the material was transferred from the melting and cogging departments to the stock yards by trucks operated over industrial tracks. This required considerable labor and being a constant cause of expense, was practically eliminated with the installation this year of crane runways extending in all directions throughout the plant.

The cranes serving the stockyard, cogging press and rolling mills together with annealing ovens, boilers and coal storage piles are of special type manufactured by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y.

The original monorail system was used only for the distribution of coal to the boiler house and various hammer furnaces in the forging department and for loading and shipping. This system has recently been extended so as to connect at right angles with the stock yard craneway. The growth of the plant made it necessary to install an additional monorail system and the coupling up of this system with the one already installed works out as follows: When coal is required at the rolling mill furnace, the stockyard crane for handling billets is brought to rest on the runway in such a position that its monorail is in line with the monorail leading to the coal storage. The crane girders are then locked in place. The traveling crane carrying an electrically operated grab bucket runs off the crane onto an I-beam trackage which leads to the coal storage. When enough coal has been conveyed to the furnace in question, the grab bucket is detached and the traveling crane returns to and again becomes a part of the stockyard crane. An automatic lock is provided on the monorail system at a point where trackage connects with the stockyard crane runway to prevent cars from leaving the track when the stockyard crane is positioned elsewhere on its runway. This system of handling materials is proving very economical and satisfactory and has cut down the labor expense to a remarkable degree.

New Mills in Operation

The 16 and 10-inch rolling mills, which were built by the Lewis Foundry & Machine Co., Pittsburgh, are now in operation. These mills are housed in a new steel building 260 feet long by 80 feet wide and are served by a 10-ton electric traveling crane equipped with 3-ton auxiliary hoist which in turn are equipped with lifting magnets. The crane was built by the Pawling & Harnischfeger Co., Milwaukee. The 16-inch mill rolled its first steel Dec. 31, 1919, and the 10-inch mill Dec. 1, 1919.

While rounds, flats, shapes, etc., can be rolled in merchant sizes on the 16- or 10-inch mills by installing rolls which are designed for producing the shape

desired, the description of both mills will be confined solely to the forming of rounds. The 16-inch train includes one roughing, two hand round and one bull head stands of rolls, all 3-high with the exception of the latter which is 2-high. The roughing rolls are turned with box passes and 18 diamond passes. The former type of pass applies pressure on the sides of the billet or ingot while the latter type effects the reduction by applying pressure on opposite corners. The greatest draft is in the first four roughing passes because the temperature of the steel during this stage of the rolling process is such that the metal can be displaced more rapidly.

The first pass is between the middle and bottom rolls, the second between the middle and top rolls and so on until the piece has been worked in all four box passes. The first two passes flatten the billet, the third edges and the fourth leaves it in the form of a square. Between the first two passes the billet is fed between the rolls without turning but thereafter the billet is turned 90 degrees in order to prevent the formation of fins and to knead the steel more thoroughly. The draft, as already pointed out, is heavy, the pressure of the rolls forcing the steel to the sides of the pass. When the pass becomes filled, the sectional area of the billet remains practically constant, the roll pressure then increasing the length of the piece.

Why Guides Are Necessary

To facilitate handling the pieces, a roller which operates at the same speed as the rolls, is built level with the middle roll on the delivery side of the pass. In order to control the direction of the bar as it leaves the rolls, guide plates are provided, the guides being of the same shape as the passes in a roll. If the pass is oval, the guide plate is made with half oval grooves; if the pass is square shaped, the guide plate is made with V-grooves. The diameter of the middle roll is ⅛-inch larger than the bottom and the top roll ⅛-inch larger than the middle, the reason for which is obvious. If both rolls were of the same diameter, the bar would jump from side to side causing a wavy-like surface. The middle roll, on account of its diameter being larger than the bottom roll, causes the under surface of the bar to bear down on the guide, which is adapted to the particular pass, thus insuring the delivery of a straight bar. The forepart of the guide plate sets in close proximity to the surface of the rolls so that any tendency of the bar to curl around the roll also is obviated.

The upper roll operates between split bearings, the top bearing being held tightly against the roll neck by means of screwdowns. When the upper pass is to be adjusted to a certain gage the screwdowns are loosened and the roll bearing screws elevated by tightening the nuts on top of the housings. This raises the bearing blocks and, consequently, the top roll. Adjusting the top roll in this manner usually entails considerable time. On both merchant trains at the Hammond plant, however, the screwdowns are connected to the top roll bearing screws by yokes and by this arrangement it is only necessary to operate the screwdowns to arrive at the proper roll adjustment.

The 16-inch mill is driven through reduction gears by a special 500-horsepower General Electric induction motor. Two 9-ton flywheels are placed one on each side of the reduction gear set and these tend to maintain a constant speed of the rolls to such an extent that when the power is shut off, approximately one minute is required before the rolls come to a standstill. Two remote control buttons are placed near the mill

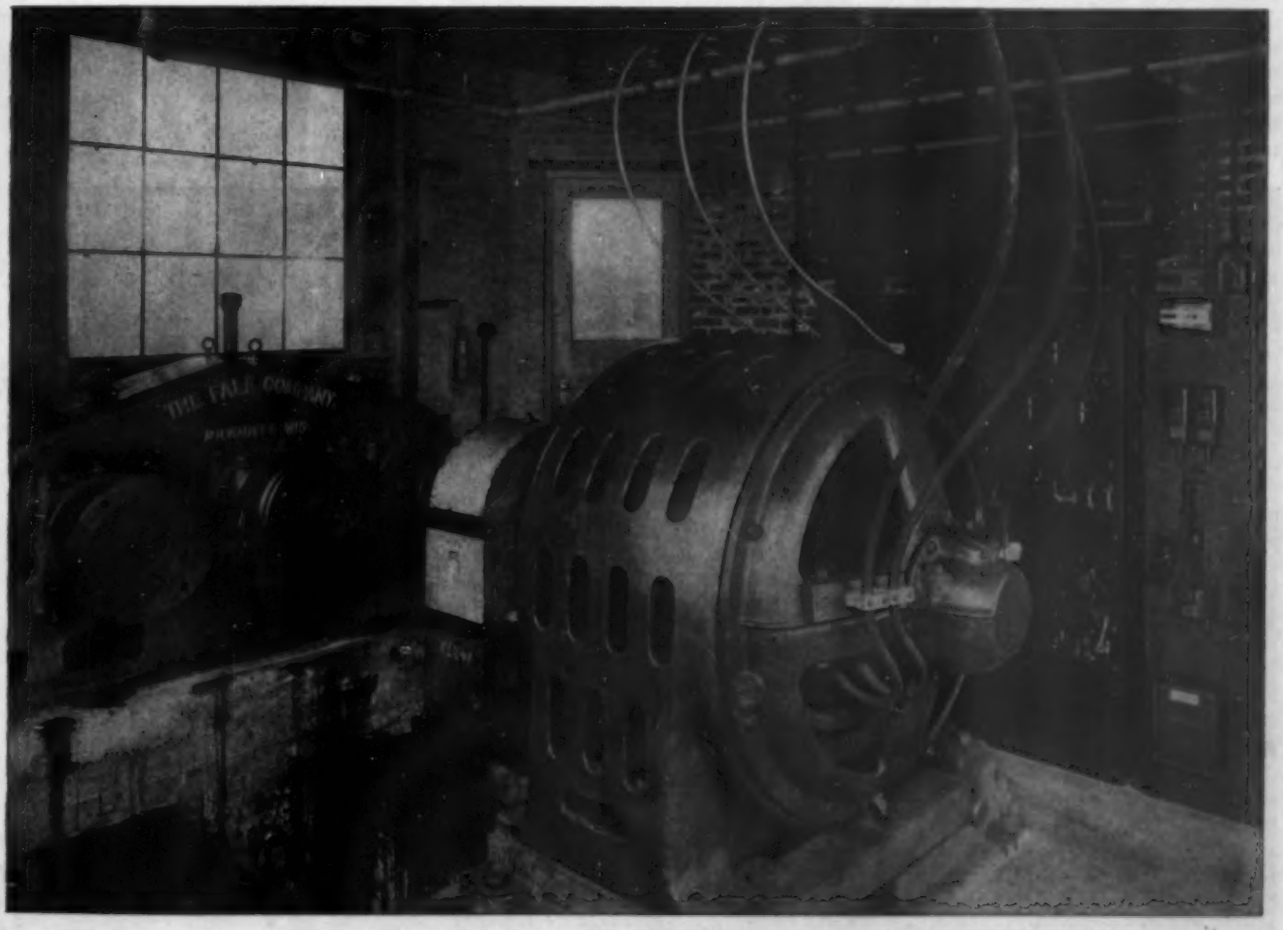


FIG. 4—REDUCTION GEAR SET ON THE 16-INCH MERCHANT MILL IS BUILT WITH THREE SEPARATE COUPLING SHAFTS FOR THE PURPOSE OF EFFECTING A QUICK CHANGE IN ROLL SPEED

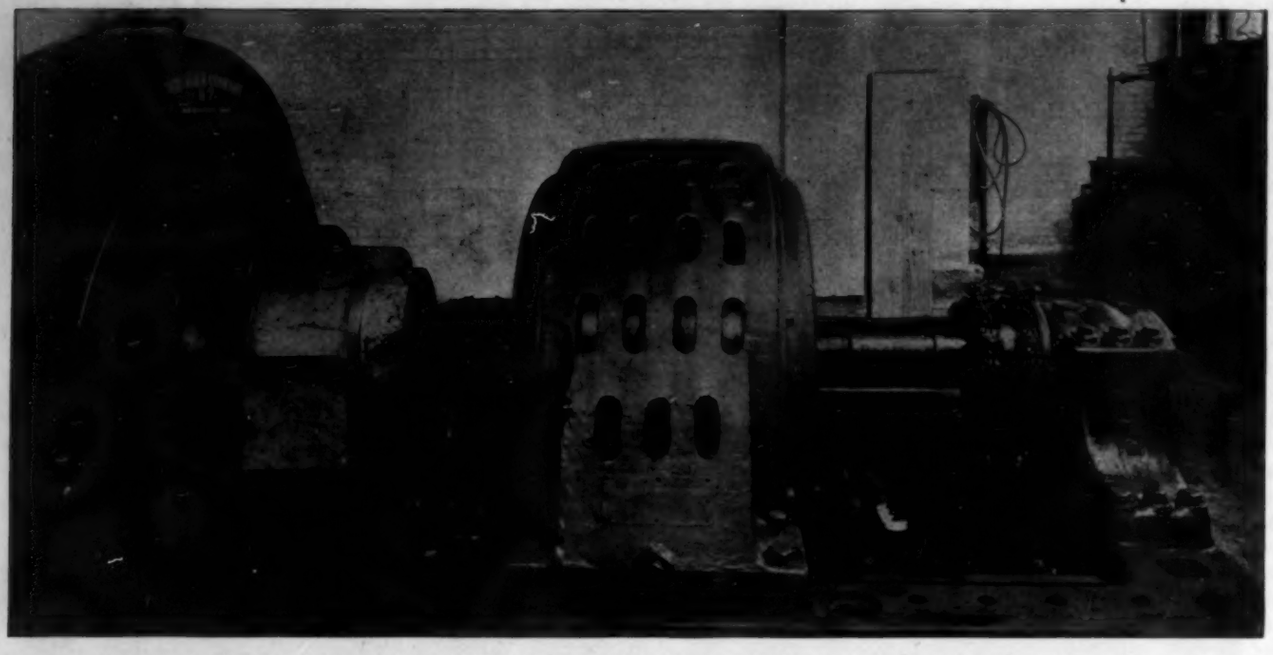


FIG. 5—TWO 9-TON FLYWHEELS, WHICH ARE PLACED ONE ON EACH SIDE OF THE REDUCTION GEAR SET OF THE 16-INCH MILL, TEND TO MAINTAIN A CONSTANT SPEED OF THE ROLLS DURING THE FORMING OPERATION

so that the operator may shut off the power without having to enter the motor room. The gear set, which was built by the Falk Co., of Milwaukee, effects a reduction of speed from 5.5 to 1. In line with the mill rolls is a set of 3-high pinions, the central unit being keyed to the reduction gear driving shaft and meshing with the upper and lower pinions. Motors, gear drivers and all electrical equipment is enclosed in brick and glass compartments which are dust proof.

In connection with the rolling mill, there has been installed a 42-inch circular type hot saw, built by the A. Garrison Foundry Co., Pittsburgh, and a straightening machine manufactured by the Abramsen Engineering Co., Pittsburgh.

Rounds from ¼ to 2 3/16 inches and flats in all sizes are rolled on the 10-inch mill. Both hand and guide rounds are rolled on this mill. When rolling 2-inch rounds the billet is given five square passes between the roughing rolls and 12 round passes between the rolls in the second stand, the last six passes being given to produce the proper surface finish and at such temperatures as will give the steel the best grain structure.

The 10-inch roll train also is driven

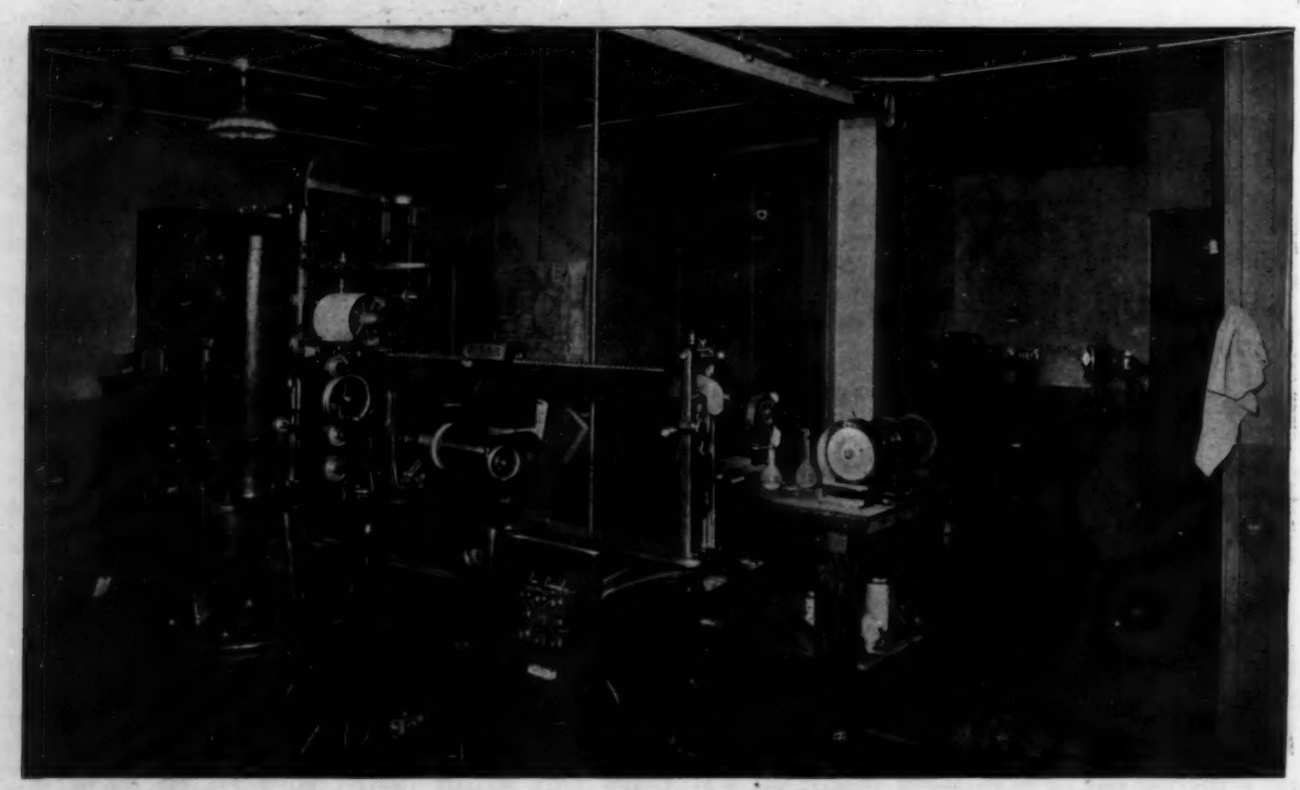


FIG. 6—PHYSICAL LABORATORY OF THE HAMMOND STEEL CO. EACH HEAT OF STEEL IS TESTED CHEMICALLY AND PHYSICALLY PRIOR TO SHIPMENT IN THE FINISHED STATE

by a special 300-horsepower General Electric Co. motor through a special three-speed reduction gear set with speeds 360:360, 360:220, 360:110, built by the Falk Co., Milwaukee. The shaft, which connects the motor with the gear set, is provided with a Francke-type flexible coupling. In case the motor should get out of line at any time, the coupling would avert the breakage of the driving shaft which otherwise might result. The reduction gear set is built with three separate coupling shafts and flanges on the motor side as shown in Fig. —, so that by coupling the motor to the proper flange, the special three-speed reduction gear unit is capable of transmitting 300 horsepower at 360, 220 or 110 revolutions per minute.

The mill motor rests on a continuous shoe plate and may be slid into correct position for making any one of the speed connections. When shifting from one connection to another, the motor is raised off the shoe plate onto rollers by a cam arrangement and is moved to the desired position by a rack and pinion. The coupling flanges are bored for bolts having a drive fit and due to this fact particular care was required in lining up the installation. Approximately 10 minutes are required to effect a speed change.

All bars are cut to specified lengths by a 24-inch, electrically driven alligator shear which was built by Doelger & Kirsten, Milwaukee. Certain orders call for annealed stock and when this is the case the bars are loaded on trucks and taken over an industrial track system to the annealing department. When the anneal is completed the material is returned to the rolling mill department, passed through the straightening machine and shipped. Railroad cars are shifted into the western end of the rolling mill building over depressed tracks. The shipping pit holds two standard length cars. Rounds, flats and squares from ¼ to 13/16-inch often are shipped in coils. The coiling machine was built by the company's mechanical department, the prongs around which the stock is wound being tapered ½-inch at the ends. The reel is motor driven.

In order to handle the increased tonnage of special annealing tool steels, additional annealing capacity is being installed, including specially designed oil burning furnaces of the car type. The annealing plant will be be served by the same monorail system as the remainder of the plant. The annealing furnaces are equipped with recording pyrometers.

Hold Hearings on Rules

Public hearings upon a proposed code of rules relating to the operation, use and maintenance of stationary engines are to be held by the safety standards committee of the Pennsylvania industrial board. The first hearing will be held in Philadelphia, April 15 at 10 a. m. at the Bellevue-Stratford hotel and the second in Pittsburgh the following day at 10 a. m. at the William Penn hotel.

The new regulations which are being urged by the industrial board have been proved as necessary to safeguard the life and limb of the worker. In the first section is a general discussion showing that the rules will apply to every establishment in the state and showing both the employer's and the employe's responsibility regarding safety devices. Definitions of the terms used in the rules are defined in the second section. The third section specifies the 14 rules which are to be followed in equipping and operating stationary engines. These regulations include mechanical safety appliances as well as safety from moving parts.

Progress in Ferroalloys

(*Continued from Page* 1122)

and carbon. Ferrocerium is one of the newest of the ferroalloys. It is made by the direct alloying of iron with misch-metal, and the ordinary ferrocerium contains 30 per cent Fe and 70 per cent misch-metal.

Considerable experimental work has been carried out on cerium steels during the past five years, but the results of the majority of these investigations have not been made public. Ferrocerium has recently been employed as a deoxidizer for cast iron, where it has been found to increase the transverse strength and deflection. Its deoxidizing action is excellent because of the high heats of oxidation of the cerium group metals. Ferrocobalt is not made any longer, so far as is known, but a number of patents pertaining to complex ferrocobalts and other cobalt alloys have been secured. Cobalt metal is preferred to ferrocobalt for making fixed additions in the manufacture of cobalt-bearing tool steels, but the use of cobalt in these steels is declining. Ferronickel is seldom made in the electric furnace, but usually by the direct alloying of iron and nickel in the desired proportions; however, nickel is added to steel usually as metallic nickel rather than as ferronickel. Ferrophosphorus is an important steelmaking alloy, but the tonnage consumed is not large. It is employed for making fixed additions of phosphorus in the open hearth in the manufacturing of sheet steels.

Ferrophosphorus is made in the United States in the electric furnace and in the blast furnace, by reduction of apatite and phosphate rock, and the electric furnace manufacture of this alloy, in connection with the fertilizer industry is a development which occurred during the war period. Domestic consumption of ferrophosphorus has been steadily increasing because of the increased demand for automobile sheets, and the electric furnace manufacture of the alloy has been undertaken by several companies in the United States in the past few years. Ferrozirconium is one of the newest of the ferroalloys. It is used for the manufacture of special zirconium steels. The alloy has been made by the thermit process, but its regular manufacture has not been undertaken commercially in the United States.

Further interest has been shown in ferrosilico-aluminum during the past two years, and experiments on the use of the alloy as a deoxidizer for steel are now being carried out; it has been recently made in the electric furnace at Baltimore. A large number of patents have been secured for the preparation of numerous complex ferroalloys, but most of these alloys have not been applied on a working scale in the metallurgy of steel.

Will Install an Additional Merchant Mill

Plans now are completed for the installation of a new 12-inch continuous merchant bar mill at the plant of the United Alloy Steel Corp., Canton, O. It will be served by a 16-inch roughing mill, both units having a rolling capacity of 10,000 tons of bars, angles, tees, flats, etc., in sizes up to approximately 3 inches. The Morgan Construction Co., Worcester, Mass., will build and erect the mills, heating furnaces, gas producers, cooling beds, shears, and other auxiliary equipment. The mill will be driven by a 3000-horsepower motor and will be served by four 10-ton cranes, contracts for which have been let to the Alliance Machine Co., Alliance, O. The units will be housed in structural steel buildings, which will be erected by the American Bridge Co., New York. The complete installation including the mill, buildings and full equipment will represent an outlay of about $1,250,000. From present indications officials plan to have the mill in operation about July, 1921.

Collective Bargaining Defined

President's Industrial Conference Outlines Policy for Labor Agreements Which It Indorsed — Success of Plan Depends on Good Faith of Both Parties — Explains Attitude on Profit Sharing, Hours of Work and Other Problems

IN THIS, the fourth installment of the National Industrial conference's report to be published in THE IRON TRADE REVIEW, *the conference analyzes questions relating to collective bargaining, and explains why it favors such a method for determining wages, hours of work and other points at issue. Child labor, housing conditions, profit sharing, woman labor and equally important subjects also are discussed.*

THE conference is in favor of the policy of collective bargaining. It sees in a frank acceptance of this principle a helpful approach to industrial peace. It believes that the great body of the employers of the country accept this principle. The difference of opinion appears in regard to the method of representation. In the plan proposed by the conference for the adjustment of disputes, provision is made for the unrestricted selection of representatives by employes, and at the same time provision is also made to insure that the representatives of employes in fact represent the majority of the employes, in order that they may be able to bind them in good faith. The conference believes that the difficulties can be overcome and the advantages of collective bargaining secured if employers and employes will honestly attempt to substitute for an unyielding, contentious attitude, a spirit of cooperation with reference to those aspects of the employment relation where their interests are not really opposed but mutual.

Essential to the success of collective bargaining is a clear realization by both sides, of the obligations which it imposes, and of the limitations of these obligations. The collective bargain usually relates to standards only, such as the rate of wages to be paid, the hours to constitute a day's work, and the conditions under which the work is to be performed. There is aso usually a specified time during which the agreed standards are to be maintained. The agreement imposes on the employer the obligation to observe these standards if he provides work. It does not bind him to provide work. Similarly, it imposes on employes the obligation to accept the agreed standards so long as they remain at work. It does not bind them to continue in employment.

Under a collective bargain establishing standards, an employer acting in good faith may close down his plant, in whole or in part, without breach of his obligation. On their side the employes may resign their positions without breach of their obligation. In such case the employer, however, is free to fill without interference the positions so voluntary vacated.

The obligation involved in a collective agreement on standards is sometimes thought of as a binding agreement by which the employes are obliged to continue in employment, although the right of the employer to shut down his plant has rarely been questioned. This is a one-sided interpretation of the agreement which would give the employer, without any reciprocal obligation, a virtual call on the services of his employes. Such an interpretation is obviousy unfair.

The above statements do not mean that during the period of the agreement the employer may lockout or the employes may strike, the purpose being to change the standards by means of economic pressure. A strike is not merely a withdrawal from employment; it is an effort to secure better terms for the positions held. Similarly, a lockout is something more than a temporary discontinuance of production; it is an attempt to force employes to accept lower standards. Both involve breach of a collective bargain on standards and are unjustifiable.

The conference has given a great deal of consideration to the whole question of enforcement of collective bargains once entered upon. As shown bargains of this character do not lend themselves readily to legal enforcement. The social and legal forces that surround the problem are of the most complex order and must be a matter of development in the community. The conference believes that for the present at least enforcement must rest substantially upon good faith. It is obvious that the essentials of success in collective bargaining lies in the fidelity of both sides to agreements.

3—*Hours of Labor*

Hours of labor, wages and women and children in industry, should be approached from the aspect both of the health and welfare of the workers, and of the efficient use of the country's resources in manpower over a prolonged period of time. The nation is not interested primarily in what one or another body of its citizens may believe to be for their immediate personal advantage; it is interested fundamentally in the progressive development of the physical, mental and spiritual wellbeing of its citizens. The question as to what constitutes this wellbeing under the complicated conditions of modern industrial life cannot be easily determined offhand, but must be based upon a body of fact, accurately ascertained from experience.

The problem of hours has undergone a fundamental change through the introduction of large scale factory production and the growing concentration of our population in cities. Men and women can work relatively long hours at work which is interesting, which calls upon their various energies, which gives some opportunity for creative self-expression. Work which is repetitive, monotonous and conducted under the confining indoor conditions of even the best industrial plant, especially where the plant is located at a distance from the homes of the workers, makes much more exacting physical and nervous demands. If the inevitable conditions of modern industry do not offer variety and continuing interest, the worker should have hours short enough for more recreation, and for greater contact with his fellowmen outside of working hours.

Studies should be made in each industry, preferably by the industry, but in its default, by the appropriate government agency, of the problem of industrial fatigue in relation to production, to determine on the basis of experience: First, what schedule of hours is consistent with the health and wellbeing of the workers; and, second, the hour schedule within the above limitations, which will afford the maximum productivity in the industry. It should be recognized by employes and employers, and primarily by the public, that hours schedules which are below the standard of maximum productivity must necessarily reduce the total industrial product, and consequently reduce the standard of living, or increase prices. Such reduction in all industry will necessarily reduce the total industrial product of the nation and the standard of living will be reduced by that much below the attainable maximum. This fact should be taken into account in connection with the advantages, in other directions, to the worker which may accrue from such a shortening of hours.

Studies which have already been made in some industries indicate that long hours do not in general result in maximum production. The conference believes that some industries are now operating, in part at least, on hours schedules which are above the standard of maximum productivity, and which in any case do not allow employes proper opportunity for rest and recreation. There are large basic industries which still employ substantial numbers of their men in exhausting work for 84 hours per week and longer. Such conditions are opposed to public interest, are contrary to every instinct of human development, and are a pregnant cause for industrial and political unrest.

It is perhaps unnecessary to point out that the conditions of various industries make any universal standardization of hours unnecessary and unwise. For example, the seasonal and intermittent nature of agricultural work and the fact that it is carried

on under out-of-door conditions which are not essentially detrimental to the wellbeing of the worker, would naturally exclude agriculture from the class of industries in which the work is confining and repetitive.

The conference believes that experience has demonstrated that in fixing hours of labor in industrial establishments at a point consistent with the health of the employes, and with proper opportunity for rest and recreation, there should in all cases be provision for one day's rest in seven.

The conference believes that in most factories, mines and workshops, and especially in repetitive work, the present trend of practice favors a schedule of hours of not more than 48 hours per week.

The conference does not think that a schedule of hours substantially less than the 48-hour standard now in operation is at this time desirable, except in industries where a scientific study of the problem on the basis already outlined, indicates that such reduction is necessary for the protection of the health and safety of the workers and is in the public interest.

The practice in some industries, of arranging by mutual agreement of employer and employes for a Saturday half holiday, without reduction of the weekly schedule of hours, has great advantages. Hours of labor schedules should be arranged on a weekly basis, and overtime should not be permitted except in case of temporary emergency.

It should moreover be borne in mind that further reduction of hours below this standard in any industry will throw an extra burden upon other industries, and may especially prejudice agricultural communities who already feel the growing competition of the cities in drawing away workers from the farm.

4—*Women in Industry*

Women cannot enter industry without safeguards additional to those provided for men, if they are to be equally protected. The danger of exploiting their physical and nervous strength with cumulative ill effects upon the next generation, is more serious and the results are more harmful to the community. Special provision is needed to keep their hours within reason, to prohibit night employment in factories and workshops, and to exclude them from those trades offering particular dangers to women.

Where women can and do perform work of equal quality and quantity as compared with that of men under similar conditions, they should receive equal pay. They should not be discriminated against in respect to opportunities for training and advancement, or the representation of their interests.

5—*Child Labor*

The federal government has already recognized the unsoundness in the economic use of the nation's resources of permitting the entrance of young children into industry. Such a practice results in the progressive degeneration of the race and tends to impair the human resources of the country on which the coming generation must rely. The matter cannot wisely be left to the sole initiative of the separate states. Such a course is not only unfair to the states which have attempted to deal with the problem. It places a premium upon states which are willing to subordinate the future wellbeing of their citizens to a present questionable competitive advantage in industry.

In considering child labor, as well as in other aspects of the industrial problem, a differentiation should be made between the various employments which children enter. The entrance of children of tender years into a mill or factory tends to stunt their development, and injure the race. The argument that the child is thus enabled to learn a trade is unsound. For the trade may be more quickly learned, with greater opportunity for subsequent progress, by a boy of 16 who has spent 10 years in elementary schooling than by a boy who loses the opportunity for intellectual and sound physical development by entering the mill at 10 or 12. On the other hand, the employment of children in agriculture may, if wisely supervised, develop physique and lay a good foundation for their more formal education in the country school.

But sheer prohibition of child labor is, at best, only a negative attack upon the problem. It is not thoroughly effective in promoting the economic welfare of the nation unless the time now spent by the child in industry is devoted to adequate schooling and to activity which will develop his physical wellbeing. We must not only protect our children from the physical degeneration which results from an early entrance into the mill or factory, we must enable them by educaton to take their place in society.

It is a startling fact that of the 5,516,163 illiterate persons of over 10 years of age in the United States at the last census, over 68 per cent were native born. There were approximately as many native born white illiterates as there were foreign born. The problem is not, therefore, solely or primarily due to the large influx of foreign men and women from the less literate countries of Europe. It is primarily a condition of illiteracy among our own people, and the lowest percentage of illiteracy, 1.1 per cent, was among the native born children of foreign or mixed parentage.

Not only are the prohibition of child labor and provision for compulsory elementary education complementary; the age limits for those two classes of legislation should be, as far as possible, the same.

Up to the present, the federal government has not been able to deal comprehensively with the subject of child labor. The present federal child labor tax law imposes a tax of 10 per cent upon the net profits of any mine or quarry which employs children under 16 years of age, and of any manufacturing establishment which employs children under 14. It makes no provision which assures the nonemployment of children in street trades and various blind alley occupations during the time they should be in school.

The fact that the former federal child labor law has been declared unconstitutional should not be interpreted as registering or encouraging popular sentiment against such legislation but rather as occasion for arousing public sentiment in the interests of the rights of childhood.

The intimate relation between these rights and both compulsory education and child labor legislation suggests that the ideal solution of the problem would be a reasonable uniformity by all the states in their legislation upon these topics. The conference, believing that the education and welfare of the childhood of the country is not entirely a local interest, urges upon all states not having adequate legislation upon child labor and compulsory education that they give these topics prompt and sympathetic consideration. Already in 40 states compulsory education up to the age of 16, with certain exceptions, has been provided for. This has opened the way for consistent legislation upon the question of child labor. Under legislation of this character experience is rapidly demonstrating that the economic, as well as other vital interests of the country, are best conserved by lengthening the period of education. This makes possible a normal physical, intellectual and social development of the youth of the country.

6—*Housing*

It is unnecessary to point out the intimate relation which exists between efficient production and the conditions of life to which a man or woman returns at the close of a day's work. When the employes of industry and commerce return to families who are housed in dwellings that are crowded, unsanitary, inconvenient and unlovely, these men and women suffer in health and wellbeing, and consequently are unable to render that effective productive effort which the nation needs. The menace of these conditions cannot be overlooked. Bad housing creates a destructive restlessness that swells the volume of industrial discontent. The relation of these factors is direct, the consequences obvious.

It must be borne in mind that during the years of the war, there was serious retardation of building operations outside of the immediate war time needs of the country. The cessation of hostilities was followed by a period of industrial readjustment which is resulting in a more rapid extension of the country's plant and factory facilities than has occurred for many years. No proportionate extension of housing facilities is accompanying this rearrangement. The present condition of insufficient housing will, therefore, be seriously aggravated rather than improved.

Provision for adequate housing is a responsibility which must rest primarily upon the local community. Concerted action in all industrial communities is necessary to deal with the problem. The community, its employes, its employers, its banks, its citizens generally should promptly take

stock of their present position and develop such a program as is called for by their local requirements. Measures should be developed to enable employes in permanently located industries to acquire, on proper terms the ownership of their own homes, with protection against the dangers of real estate speculation and exploitation. The states should likewise initiate systematic inquiries into the subject, including the extension of proper building and housing codes, already successfully applied in many localities. The studies of the federal government in this field should be continued and emphasized.

7—Wages

Considered from the standpoint of public interest, it is fundamental that the basic wages of all employes should be adequate to maintain the employe and his family in reasonable comfort, and with adequate opportunity for the education of his children. When the wages of any group fall below this standard for any length of time, the situation becomes dangerous to the wellbeing of the state. No country that seeks to protect its citizens from the unnecessary ravages of disease, degeneration and dangerous discontent, can consistently let the unhampered play of opposing forces result in the suppression of wages below a decent subsistence level. Above that point, there may well be a fair field for the play of competition in determining the compensation for special ability, for special strength or special risk, where risk is unavoidable, but below that point the matter becomes one of which the state for the sake of its own preservation, must take account.

The nation is interested in the welfare of its citizens not only from the point of view of wages, but from the not unrelated one of productivity. If, therefore, the conference recommends the establishment of hours and wages on a basis of justice to employes, it must also recommend that the employes do their part in seeing that the productivity of the nation is safeguarded. The nation has a right to ask that employes impose no arbitrary limitation of effort in the prosecution of their work. Such limitation decreases the country's output, and if practiced at all generally, is bound to result in a decline of the standard of living. It is gratifying that many leaders of organized labor are in agreement as to the unsoundness of such limitation of output, and are opposed to its practice.

If it is for the nation to insure that wages shall not sink below a living level, and for employes not to restrict production; it is incumbent upon employers to see that special effort and special ability on the part of their employes receive a stimulating compensation. If increased output and efficiency are met only by a reduction of piece prices, the incentive to such effort is taken away. Employes to do their best work must feel that they are getting a reasonable share of any increased return that they bring the industry. Labor incentive is a factor that it is as shortsighted to ignore as incentive to capital.

From this standpoint, the question of methods of wage payment is one that deserves careful study on both sides. Industries which have established facilities for mutual discussion of such questions, whether through unions or other forms of employe representation, are finding that it is possible at the same time to safeguard the worker from exploitation and to safeguard incentive to production.

8—Profit Sharing and Gain Sharing

Profit sharing is regarded in some quarters as a complete solution of industrial problems. The conference believes that while it has promise in some directions, it cannot by itself, be considered to be of far-reaching effect. Profit sharing in its simplest form has met with success under certain conditions, sometimes where an unusual personality has contributed to a happy outcome, sometimes where the contribution of individual employes to the profits of an enterprise can be measured with some accuracy. It has proved of beneficial effect when applied to employes occupying executive and management positions, and to sales organizations. Its extension to all the employes of typical manufacturing plants meets with difficulties. It is not easy to determine what part of the profits or losses of such plants are attributable to the efforts of the rank and file of the employes, or to apportion among them shares of profits which shall be steadily in accord with the spirit and the direct outcome of their individual efforts.

Nevertheless, the conference thinks that the field is one in which sincere experiments may add a real knowledge of desirable procedure, and therefore that profit sharing experiments should be welcomed, particularly when carried out as part of a consistent policy of bringing employer and employe together, and promoting among employes a sense of interest and responsibility. Like employe representation, its usefulness depends on the spirit in which it is organized and administered. A mechanical application, especially when accompanied with pretentious announcements and claims, may do more harm than good. The conference cannot see in profit sharing anything in the nature of a panacea, but it believes that, properly adapted to the character of the individual business, and carried out in a spirit of genuine mutuality, it may often better industrial relations. In order to accomplish the result aimed at, the allotted shares of profit obviously should be supplements to fair wages, and in no sense a substitute for fair wages, or in lieu of deductions therefrom.

There has been some promising experience in the cognate field of gain sharing. Here the employes in a particular department or subdepartment share in the gains in production and in reductions of cost which are accomplished by the joint efforts of the management and themselves. Under such plans the employes can see clearly the immediate relation between their own efforts and the resulting return. There enter no complicating factors of gains and losses made in the purchasing and selling departments for which the productive shop employes are in no way responsible. And here also the distribution to employes can be made at such frequent intervals as to bring into more immediate relation the effort and the return.

9—Thrift Agencies

Good industrial management on the part of a nation will analyze preventable human losses and provide adequate resources for meeting them. Such losses in human efficiency could be lessened by more adequate agencies to promote thrift, in connection with provision against illness, old age, premature death and industrial accident.

There have been many plans of health insurance and old age insurance elaborated in other parts of the world and advocated in the United States. Without discussing whether such plans, when based upon government subsidy or compulsory action, are consonant with American ideals, the conference believes that an extension and simplification of the insurance principle as a means of promoting thrift, saving and independence, would be advantageous to the people. The alternative to such insurance against sickness and old age lies in a wage adequate to cover these items. The conference therefore suggests that the federal government should inaugurate a careful, authoritative investigation on the whole subject.

It feels that such investigation could well include such items as the possibility of converting the great multitude of small Liberty loan investments in the country, with all the attendant difficulty of collecting small amounts of interest, into some form of old age annuities. Such measures would extend the investment of savings in government securities, would be more economical in administration than present direct bond investments, and would be more stimulative to thrift and saving. A policy of this sort would furnish a method by which many industrial concerns and their agencies, which are endeavoring to make provision out of profits for old age security of their employes, could find a safe and helpful avenue for such investment.

The problem of health and of old age insurance, and its promotion by some means consonant with national ideals, demands consideration. If such means can be devised, they will furnish a relief to the states in the care of the ill, the indigent and the aged.

The entire subject needs careful investigation and public discussion which could, with great advantage, be promoted by the federal government.

(To Be Continued Next Week)

In blast furnace practice the yield of the iron, phosphorus and 75 per cent of the manganese from the ore, cinder and scale charged using natural analysis, divided by 0.95 and the resultant quantity divided by the weight of the ore, scale and cinder charged, gives the theoretical yield of the burden.

Fluor spar is added to a vicious slag to make it thin. As the fluor spar melts it dissolves other constituents of the slag and is therefore considered a flux. Any excess of fluor spar may be counteracted by the addition of a small amount of powdered petroleum coke or lime.

German Steel and Iron in 1920-II

Official Statistics Show Production Reduced Two-thirds — Prices Rise as Mark Falls—Market Tending Toward Barter Basis—Partial Payments in Foreign Money — Big Iron Ore Imports Necessary

BY H. COLE ESTEP
European Manager, The Iron Trade Review

"WE ARE large stockholders in Germany." This statement, made to the writer in Essen by an official commissioner of the British government, perhaps explains the real position of the allied and associated powers at the present time with reference to the former German empire, as accurately and vividly as any other conception. "The days of war," the official in question explained further, "are slowly giving way to those of peace; the ways of war must yield to the methods of business. What the world needs with its vast reconstruction problem is the business point of view. Our relation, specially to Germany is that of a shareholder who expects dividends. These dividends, in the form of reparation payments and services as specified by the treaty of peace, must be paid, but that can only be accomplished by a going concern."

Here, it seems, lies an opportunity of unusual scope for business statesmanship, for as the writer endeavored to point out in the preceding article, Germany, the source of the dividends in this case, is at least temporarily insolvent, and exhausted financially, morally and physically. The situation is akin to one in ordinary business where the guiding hand of a skillful committee of creditors is necessary to avoid the losses which inevitably flow from a formal bankruptcy.

Among the assets which such a committee would examine and appraise, is the German iron and steel industry. In fact it is perhaps not too much to say it is one of the most valuable of Germany's resources remaining from the wreckage of the great war, and one capable of making a most important contribution toward the dividend account. With the point of view suggested by the foregoing in mind, it will be the purpose of this and the two remaining articles of this series to give the American reader some idea of the real state of affairs in the German iron and steel industry at the present time, so that in a general way its position in the industrial activities of the world may be oriented. This survey, which it is hoped to present, necessarily will be sketchy in many particulars, as a result of dealing with so vast a subject in limited space. For this the author asks indulgence, in the hope that some measure of fact and information may be contributed to what is beyond doubt a most important subject.

Table I
German Coal Output

Year	In millions of metric tons Coal	Lignite
1919	116	94
1918	160	101
1917	167	95
1916	159	94
1915	147	88
1914	161	84
1913	190	87

Production, Prices and Markets

First in order of importance in dealing with the German iron and steel business are its productive capacity, the prices at which its products are sold, and the market conditions surrounding the sale of those products. Production, prices and markets will therefore be the theme of this article. It will be followed by an article dealing with the almost equally important subjects of labor, international exchange, export and import policies, and government and corporate finance as they affect the German iron and steel industry. Finally there will be presented a sketch of the physical side of the problem, dealing with plant equipment, transportation facilities, etc.

In considering production, the two fundamentals of iron and steel manufacture, coal and iron ore, must not be overlooked. In fact a knowledge of the coal situation is exceedingly important in any study of Germany's industrial affairs at the present time, and coal supply is of course particularly vital to the iron and steel industry.

Condensed statistics of German coal production for the past seven years are shown in Table I. As these figures indicate, the output of ordinary steam coal has shrunk from 190,000,000 metric tons in 1913 to 116,000,000 metric tons in 1919. In other words, the output has dropped to 60 per cent of its prewar dimensions. It is from this residue of production that Germany must make the coal deliveries specified by the peace treaty and endeavor to keep her industries going. There is great apprehension in Germany that this even meager supply may be further curtailed by the plebescite which is scheduled to take place in Upper Silesia, as a result of which this territory may be lost to Germany. The Silesian coal mining district last year produced about 24,000,000 metric tons, or about one-fifth of Germany's entire output.

Lack of coal is one of the principal reasons why the iron and steel works in unoccupied Germany are operating at present at only half of their capacity. The Ruhr mining district around Essen is of course the most important coal producing center in Germany; its output was about 50,000,000 tons last year. In the effort to improve this production, the Prussian government has introduced a bill providing for the colonization of miners on a large scale in the Ruhr district. It is hoped that this measure will ultimately attract 150,000 fresh min-

FIG. 1—GERMANY'S LARGEST BLAST-FURNACE PLANT—KRUPPS AT RHEINHAUSEN

ers and increase the population of the Ruhr by 600,000. The cost of executing this scheme, however, will be about 1,000,000 marks, and in the present state of German governmental finances there is grave doubt as to whether it can be carried out. Nevertheless, such an increase in the number of coal miners seems to offer the only practicable solution to the existing problem. The men at present engaged are working tolerably well, although the production per man per hour is only 106 kilograms compared with 117 kilograms before the war. It should be borne in mind, however, that the miners at present are underfed and that no improvement in production can logically be expected as long as the existing semistarvation continues.

Furthermore, the physical condition of the coal mines has been allowed to deteriorate considerably, with the result that the ratio of actual miners to the total number of employes has fallen heavily. This has resulted from the necessity for diverting a large number of men to emergency repair work and maintenance operations which do not result directly in the production of coal. Thus a bitter harvest is being reaped from the failure to maintain the physical condition of the mines to insure proper efficiency during the war.

The total number of miners now employed in the Ruhr region exceeds the number at the time of the armistice by 65,000. The limit of housing capacity has been reached and any further material increase must follow the execution of the government's colonization scheme or some other housing plan. As a result of a recent agreement on the part of the miners to work one extra shift per week, mentioned in the preceding article, the monthly production is now slightly in excess of 10,000,000 tons for unoccupied Germany. It reached its low point of 8,312,000 tons in June and the efforts to increase production exerted between June and November resulted in an output of only 9,390,000 tons in the latter month. The monthly average production in 1913 was 14,383,000 tons and in 1918, 12,301 tons, according to the official statistics of the supreme economic council.

In view of their unusual importance to iron and steel production a further examination of Germany's coal resources is in order. Based on explorations made to a depth of 3900 feet, Germany's known coal reserves were officially estimated at 57,000,000,000 metric tons before the war. To

Table II

German Coke Prices

For Westphalian Furnace Coke

Date	Price Marks per metric ton
July 1914	16
Sept. 1918	36
Jan. 1919	58
June, 1919	96
Jan. 1920	122
March 1920	126
March 1920, foundry coke	132

Prices in Upper Silesia 10 to 12 per cent lower.

Table III

Production of Pig Iron in German Customs Union

Official Statistics Compiled by the German Foreign Office for Peace Conference Purposes

In Metric Tons of 2204.6 Pounds

By months Month	1913 Tons	1913 Per cent of 1913	1914 Tons	1914 Per cent of 1913	1915 Tons	1915 Per cent of 1913	1916 Tons	1916 Per cent of 1913	1917 Tons	1917 Per cent of 1913	1918 Tons	1918 Per cent of 1913	1919 Tons	1919 Per cent of 1913
January	1,611,345		1,566,695	97¼	874,133	54¼	1,078,368	67	1,082,797	67¼	933,570	57¾	499,352	27¾
February	1,493,877		1,445,670	96¾	803,623	53¾	1,036,683	69⅓	943,547	63¼	892,788	59¾	472,878	30
March	1,629,463		1,602,896	98⅓	938,438	57½	1,114,194	68⅓	1,104,653	67¾	1,039,092	63¾	554,138	34
April	1,588,701		1,534,429	96½	938,679	59	1,073,716	67½	1,131,620	71¼	1,084,601	68¼	435,242	27½
May	1,643,069		1,607,193	97¾	985,968	60	1,112,574	67¾	1,198,171	73	1,184,794	72¼	524,986	32
June	1,609,748		1,531,313	95	989,877	61½	1,079,849	67	1,124,998	70	1,182,415	73½	527,035	32¾
July	1,648,818	100	1,561,944	94¾	1,047,503	63½	1,133,092	68¾	1,190,014	72¼	1,179,947	71½	575,634	35
August	1,640,016		586,661	35¾	1,050,610	64	1,145,239	69¾	1,185,968	72⅓	1,155,084	70½	569,375	34⅓
September	1,590,849		580,087	36½	1,034,124	65	1,116,752	70¼	1,119,635	70⅓	1,105,366	69½	534,491	33⅓
October	1,653,051		729,822	44¼	1,076,343	65	1,161,005	70¼	1,076,222	65	1,057,920	64	550,656	33¼
November	1,588,985		788,956	49¾	1,019,184	64	1,101,311	69⅓	1,007,731	63½	566,509[1]	35¾	524,375*	33
December	1,611,250		854,186	53	1,031,449	64	1,131,955	70¼	976,891	60½	481,436[1]	30	524,375*	32½
Total	19,309,172	100	14,389,852	74½	11,789,931	61	13,284,738	68¾	13,142,247	68	11,863,522	61⅓	6,292,537	32½
By districts														
Rhenish-Westphalian	8,209,157		6,610,119	80½	5,165,618	63	5,749,806	70	5,932,914	72¼	5,819,087	71	3,887,557	47½
Silesia	994,604		853,957	85	777,625	78	784,052	79	751,805	75½	693,447	69¾	452,628	45½
Siegerland and Hessian-Nassau	994,927		702,741	70½	789,650	79¼	868,544	87¼	967,800	97¼	926,519	93		
Northern, Eastern and Central Germany	1,001,321	100	734,659	73¼	602,826	60¼	663,666	66	860,878	85¾	773,123	72¾	No figures	
Southern Germany	320,456		266,065	64½	234,669	73¼	255,325	76½	168,627	52½	168,322	52½		
Saar Dist. and Bavarian Palatinate	1,370,980		954,738	69⅔	801,597	64¼	944,730	69	898,350	65½	804,234	58⅔		
Lorraine	3,869,866		2,358,186	60¾	1,817,965	46¾	2,061,115	53¼	2,020,135	52¼	1,494,872	38½	Surrendered	
Luxemburg	2,547,861		1,909,387	74¾	1,599,981	62¾	1,957,500	76¾	1,541,748	60½	1,183,918	42⅔		
German Customs Union, total	19,309,172	100	14,389,852	74½	11,789,931	61	13,284,738	68¾	13,142,247	68	11,863,522	61⅓	6,292,537	32½
By kinds of pig iron													575,525[4]	
Foundry and hematite[2]	3,657,326		2,494,832	68¼	2,283,538	62½	2,019,991	55¼	2,012,277	55¼	1,666,716	45½	837,781[5]	38½
Bessemer	368,840		237,988	64½	187,522	51	152,660	41⅓	130,019	35¼	125,203	34	55,835	15
Basic[3]	12,193,336		9,289,980	76¼	7,246,322	59½	8,515,086	70	8,307,571	68¼	7,332,334	60¼	3,156,029	26
Manganese pig, 4-8 per cent mn., spiegel, ferromanganese and ferrosilicon	2,599,887	100	1,996,786	76¾	1,793,865	69	2,380,303	91⅗	2,446,092	94	2,533,222	97½	1,508,037	58
Forge	489,783		370,257	75¾	278,684	57	216,692	44¼	195,351	40	170,513	35	107,188	22
Miscellaneous			[3]		[3]		[3]	....	50,937	....	35,534	....	52,142	....
Total	19,309,172	100	14,389,852	74½	11,789,931	61	13,284,738	68¾	13,142,247	68	11,863,522	61⅓	6,292,537	32¼

Note: The percentages are for comparison with 1913 output which is taken as 100 per cent. Before the war the German Customs Union included the German Empire as of 1914 and Luxemburg.

[1]November and December, 1918, are without southwestern, occupied, districts.
[2]Including direct-metal castings and hematite pig.
[3]Not separately included in 1913, 1914, 1915 and 1916.
[4]Hematite pig.
[5]Foundry pig.
*For basic-bessemer process.
*Estimated.

Table IV

Production of Steel in German Customs Union

Official Statistics Compiled by the German Foreign Office for Peace Conference Purposes

In Metric Tons of 2204.6 Pounds

By months	1913		1914		1915		1916		1917		1918		1919	
Month	Tons	Per cent of 1913	Tons	Per cent of 1913	Tons	Per cent of 1913	Tons	Per cent of 1913	Tons	Per cent of 1913	Tons	Per cent of 1913	Tons	Per cent of 1913
January			1,599,757	101½	970,605	61½	1,235,937	78⅓	1,407,293	89¼	1,250,873	79½	568,456	36
February			1,509,774	95⅔	953,006	60¼	1,245,953	79	1,201,073	76¼	1,225,230	77⅔	532,541	33¾
March			1,634,275	103½	1,105,126	70	1,371,145	87	1,468,717	93	1,339,320	84⅞	654,893	41½
April			1,488,523	94½	1,019,149	64½	1,220,529	77⅓	1,355,216	86	1,416,922	89⅞	426,910	27
May			1,577,943	98¼	1,050,922	66⅔	1,422,865	90¼	1,457,084	92½	1,458,440	92½	602,926	38
June	1,577,924[1]	100	1,558,598	98⅝	1,088,468	69	1,327,638	84	1,411,437	89½	1,451,437	92	639,675	40½
July			1,627,782	103¼	1,145,480	72⅔	1,365,471	86½	1,435,617	91	1,435,861	91	796,331	50½
August			567,610	36	1,162,463	73⅔	1,426,484	90½	1,492,356	94½	1,462,423	92⅔	739,387	46⅞
September			660,615	42	1,178,111	74⅔	1,402,687	89	1,373,139	87	1,372,890	87	748,760	47½
October			900,227	57	1,219,048	77⅓	1,439,160	91¼	1,439,478	91¼	1,354,242	86	763,930	48¾
November			892,814	56⅔	1,196,443	75⅝	1,382,461	87⅔	1,335,718	84⅔	717,585[2]	45½	647,380*	41
December			928,294	58⅞	1,169,233	74	1,342,190	85	1,310,232	76⅜	494,282[2]	31½	647,380*	41
Total	18,935,089	100	14,946,212	79	13,258,054	70	16,182,520	85½	16,587,360	87⅝	14,979,505	79¼	7,768,569	41
By districts														
Rhenish-Westphalia	10,112,042		8,420,706	83¼	7,642,122	75⅝	9,165,033	90⅝	9,363,006	92½	8,681,307	86	5,253,472	52⅛
Silesia	1,407,304		1,173,066	83½	1,170,263	83½	1,402,809	99⅝	1,459,526	103⅝	1,344,612	95½	842,487	60
Siegerland and Hessian-Nassau	388,297		306,399	78⅝	296,439	76¼	339,505	87½	323,937	83½	270,682	69⅝		
Northern, Eastern and Central Germany	740,859	100	604,793	109	543,454	73¼	694,522	93⅝	917,248	124	892,188	120¼		
Kingdom of Saxony	331,125		259,695	78¼	263,580	79½	342,899	103	419,212	126¾	394,535	119½	No figures	
Southern Germany	253,020		144,126	57	134,732	53⅓	152,363	60¼	208,364	82¼	202,730	80		
Saar Dist. and Bavarian Palatinate	2,079,825		1,390,248	67	1,050,475	50½	1,319,847	63½	1,267,293	61	1,113,614	53½		
Alsace-Lorraine	2,286,354		1,510,692	66¼	1,178,230	51½	1,456,113	63⅝	1,547,107	67⅝	1,223,103	53½		
Luxemburg	1,336,263		1,136,487	85	978,759	73¼	1,309,429	98	1,081,667	81	856,734	64¼		
German Customs Union, total	18,935,089	100	14,946,212	79	13,258,054	70	16,182,520	85½	16,587,360	87⅝	14,979,505	79¼	7,768,569	41
By kinds														
Basic bessemer ingots	10,629,697		8,143,619	76⅝	6,529,285	61½	7,653,990	72¼	7,294,899	69	6,410,751	60½	3,200,000*	30
Bessemer ingots	155,138		100,617	64½	164,570	106	175,109	113	173,430	111¾	148,980	96	.....	....
Basic open-hearth ingots	7,330,424		5,946,215	81¼	5,423,364	74	6,579,892	89¾	7,056,690	96	6,593,416	90	3,300,000*	45
Acid open-hearth ingots	283,480	100	274,321	97	248,649	87¾	276,909	97½	217,783	76¾	184,490	65¼	.....	....
Basic steel castings	253,587		210,845	83	461,816	182	767,586	301½	666,237	262½	556,010	219⅛	200,000*	79
Acid steel castings	109,329		87,243	79¾	198,213	182	430,793	395½	828,837	760	759,266	697	375,000*	344
Crucible steel	84,553		95,096	112½	100,578	119	108,205	128	129,784	154	86,555	102⅜	.....	....
Electric steel	88,881		88,256	99¼	131,579	157	190,036	227	219,700	262½	240,037	287	.....	....
Total	18,935,089	100	14,946,212	79	13,258,054	70	16,182,520	85½	16,587,360	87⅝	14,979,505	79¼	7,768,569	41

Note: [1]Monthly figures for 1913 not available.
[2]November and December, 1918, figures do not include southwestern, occupied and surrendered, districts.
*Estimated.

this it was estimated 137,600,000,000 tons of probable reserves could be added, making the total prewar stock of coal in Germany 194,600,000,000 tons. As a result of the loss of Lorraine, the occupation of the Saar district and the possible cession of Upper Silesia, the known reserves will be reduced to about 40,000,000,000 tons and the probable reserves to 38,000,000,000. In other words, it is now estimated that German coal reserves within the new boundaries amount to 78,000,000,000 tons or 40 per cent of the prewar tonnage.

What Germany Must Do

These figures, however, are not as important as the ratio of consumption to production. The production figures for 1919 and prior years already have been cited. The German government has made further unofficial calculations of consumption, which show that the country's own requirements in 1920 will be about 119,400,000 metric tons. While these figures should perhaps be accepted with certain reservations, they represent the only tangible statistics available. On top of the 119,400,000 tons just cited, the peace treaty requires delivery to the allies of 43,300,000 tons per year on the average for the next five years. A reduction may take place during the first year of peace at the discretion of the entente.

According to the foregoing, however Germany must provide 162,700,000 tons during 1920. Based on 1919 output, the apparent deficit is 46,200,000 tons. In other words, allowing for no reduction in the demands of the allies, Germany must scale her own requirements down to 73,200,000 tons. It is further claimed that of this residue something over 19,000,000 tons must be exported to neutrals and others to pay for absolutely necessary food imports, leaving a final balance for the satisfaction of Germany's own needs during this year of 54,000,000 tons.

FIG. 2—LARGE MIXER IN GERMAN BASIC-BESSEMER CONVERTER WORKS

Of this 54,000,000, the coal mines for their own requirements want 8,000,000 tons; domestic consumption is about 17,000,000 tons; public service plants require 7,000,000 tons; and railroads together with ship bunkering use 14,000,000 tons; leaving 8,000,000 tons for all of the industries in Germany including the iron and steel industry. This latter figure is about one-eighth of the annual amount of coal consumed by the industries of Germany in 1913, eliminating Lorraine, Luxemburg, the Saar district and Upper Silesia.

Must Increase Production

The requirements of industry cannot of course be anywhere nearly satisfied by 8,000,000 tons per year. The only hope lies in increased production and in the readjustment of consumption inside the country, together with some relaxation in the de-

Table V

German Pig Iron Prices 1913-1920

Statistics Prepared by German Foreign Office—Prices Are in German Marks Per Metric Ton at Official or Controlled Quotations

	Hematite	Basic	No. 1 Foundry	No. 3 Foundry	Forge	Spiegel
1913[1]						
January	81.50	59.83	77.50	74.50	69.00	82.00
1914						
January	79.50	60.56	75.50	70.50	66.00	79.00
June	79.50	60.56	75.50	70.50	66.00	79.00
July	79.50	60.56	75.50	70.50	66.00	79.00
September	78.00	60.56	74.50	69.50	66.00	79.00
December	83.00	60.56	79.50	74.50	71.00	84.00
1915						
January	93.00	64.07	79.50	74.50	71.00	84.00
April	100.00	64.07	86.50	81.50	78.00	91.00
July	115.00	64.07	94.00	89.00	85.50	98.50
December	115.00	64.07	94.00	89.00	85.50	98.50
1916						
January	115.00	70.72	94.00	89.00	85.50	108.50
March	122.50	70.72	96 00	91.00	90.50	111.50
August	142.50	70.72	96.00	91.00	90.50	114.50
December	142.50	70.72	96.00	91.00	90.50	119.50
1917						
January	167.50	97.00	121.00	116.00	115.50	146.50
May	180.40	110.00	124.90	119.90	119.50	150.40
August	194.40	120.00	132.90	127.90	127.40	158.40
September	212.00	128.00	137.00	132.00	131.00	162.00
October	219.00	128.00	141.50	136.50	135.50	166.50
November	223.00	130.00	141.50	136.50	135.50	166.50
December	223.00	132.50	141.50	136.50	135.50	166.50
1918						
January	223.00	132.50	141.50	136.50	135.00	166.50
March	223.00	132.50	141.50	136.50	135.00	166.50
April	223.00	132.50	141.50	136.50	135.00	166.50
June	223.00	132.50	141.50	136.50	135.00	166.50
July	223.00	132.50	141.50	136.50	135.00	166.50
September	223.00	132.50	161.50	156.50	135.00	166.50
October	223.00	132.50	161.50	156.50	135.00	166.50
December	223.00	132.50	161.50	156.50	135.00	166.50
1919						
January	314.50	215.00	250.00	249.00	240.00	259.00
February	314 50	215.00	250.00	249.00	240.00	259.00
March	314.50	215.00	250.00	249.00	240.00	259.00
April	366.50	296.50	340.00	339.00	303.50	331.00
May	407.00	341.50	391.00	390.00	352.00	389.00
June	418.50	354.50	405.50	404.50	363.50	402.00
July	460.50	391.56	439.00	438.00	395.00	432.00
August	573.50	452.00	517.59	516.50	465.00	502.00
September	573.50	452.00	517.50	516.50	465.00	502.00
October	735.50	603.00	652.50	651.50	465.00	623.00
November	735.00	603.00	652.50	651.50	465.00	623.00
December	1000.50	850.00	914.50	913.50	592.00	896.00
1920[2]						
January	1171.50	850.00	914.50	913.50	.....	896.00
February	2227.00	1600.00	1637.00	1636.00	.....	1383.00
March	2227.00	1600.00	1637.00	1636.00	.....	1383.00

[1]Marks at par, 1 M=23 4-5 cents. [2]Marks at 5 per cent of par, approximate 1 cent.

mands of the allies. But in the meantime, of course, German industry must accept the handicaps which the existing situation imposes and for some time to come large blast furnace plants must operate at reduced capacity. At the Krupp plant at Rheinhauser for instance, out of 12 blast furnaces only four are active at present and the management of Krupps does not expect much improvement for an indefinite period.

Lost Three-Quarters of Her Ore

Turning now to iron ore, we find another great obstacle to full production. The situation is perhaps even more unsatisfactory than that surrounding the supply of fuel. For although Germany still retains two-thirds of her known coal resources, she has lost 77 per cent of her iron ore reserves through the cession of Lorraine to France. It should not be overlooked, of course, that much of this tonnage is in territory which was forcibly torn away from France in 1871 and Germany is, therefore, only restoring that to which she originally had no right. Nevertheless the immediate effect on the German iron and steel industry is little short of catastrophic. It is hardly too much to say that the entire future of German steel production depends on the success with which arrangements may be negotiated with France for minette iron ore. Since France needs coal, the beginnings of such an arrangement already have been made through an agreement to exchange one ton of German coke for 1¼ tons of Lorraine ore on a basis of shipments respectively of 8125 tons of ore and 6500 tons of coke daily. This agreement has been in effect since July, 1919, and largely as a result of it, German pig iron production has been maintained at the rate of approximately 525,000 tons per month, compared with 1,074,000 tons per month in 1913 and 765,000 tons per month in 1918.

In addition Germany must import considerable quantities of higher grade ores from Sweden and Spain, her own mines within the new borders set down by the treaty producing only about 7,500,000 tons of low grade ore a year. With marks at one-twentieth of their normal value, the difficulties encountered in financing foreign supplies is obvious. Here lies another important cause for lack of production in German iron and steel works.

Dealing with this whole question of iron ore, a semiofficial memorandum made available to the writer contains the following statement, which may be repeated bearing in mind that the situation undoubtedly is presented in the most favorable possible light for Germany:

"Germany's total stock of iron ore available for exploitation before the war, according to Dr. Krusch, amounted to 2,300,000,000 tons. About 4,000,000 tons, or 0.17 per cent of the total, were in Upper Silesia and 1,770,000,000 tons, or 77.4 per cent, in Alsace-Lorraine. Germany's loss therefore through the cession of Lorraine and possibly of Upper Silesia amounts to more than three-quarters of her total stock of ore. In 1913 Germany's output of iron ore amounted to about 28,600,000 tons of which Upper Silesia contributed 140,000 tons, or 0.4 per cent of the total, and the Minette district of Lorraine 21,000,000 tons, or 71.7 per cent. Germany's consumption of iron ore in 1913 amounted to approximately 46,394,000 tons. She has available at present within the borders laid down by the treaty 7,500,000 tons of annual output. At present, counting out Lorraine, Luxemburg, the Saar district and possibly Upper Silesia, the remainder of Germany may be estimated to require about 26,000,000 tons of ore annually. Apparently, therefore, imports of at least 19,000,000 to 20,000,000 tons are necessary annually. It remains to be seen," the memorandum concludes, "whether any, and if so up to what proportion, of this may be covered by imports from Lorraine and Luxemburg."

Production at a Low Ebb

Having now dealt with the two principal raw materials of iron manufacture, coal and ore, we can take up the production of iron and steel products themselves. Condensed statistics were presented in a preceding article. As these figures showed, the output of steel decreased from 18,935,089 metric tons in 1913 to 7,768,569 tons in 1919, with the months of November and December estimated. Pig iron production may be compared in the same way. It amounted to 19,309,172 metric tons in 1913 and 6,292,537 metric tons in 1919.

The important details of both iron and steel production are presented in Tables III and IV. These figures are official, having been prepared by the German foreign office for its own use, and they are well worth considerable

study, since they disclose details of German iron and steel production by months, districts and grades before, during and since the war, which have not heretofore been published. In fact, it is doubtful if these figures, in the detail in which they appear in Tables III and IV have ever been permitted to leave Germany before. The disastrous results of the past year are clearly indicated in these tables, although some details for 1919 are not available. Turning to Table III, in which pig iron figures are presented, the importance of the Rhenish-Westphalian district is self evident. It produces only little short of half the pig iron output of Germany. Upper Silesia, which shortly may be lost to Germany, also is an important producer of pig iron. Its output in 1913 was 994,604 tons. Last year this figure was reduced to 452,628 tons, showing that its relative importance has not diminished. The Silesian ironmasters, in fact, met with rather fair success in their efforts to improve their output throughout 1919, with the result that the monthly production was increased from 56,801 tons in February to 95,993 tons in October.

Further exceedingly interesting production details are obtainable from Figs. 3 and 4, a reproduction of an official chart also prepared by the German foreign office for its own use. In this chart the production of pig iron, ingots and rolled steel products is expressed in detail diagramatically, both by districts and by kinds of material. This chart shows that although the total production of pig iron in 1918 in Germany was only 61 per cent of the output in 1913, nevertheless the production of what the Germans call *Stahleisen* or high manganese iron, together with spiegeleisen, ferromanganese and ferrosilicon, in 1918 was 97½ per cent of that produced prior to the war. The output of basic iron also has been well maintained and the output in 1918 according to Fig. 4 was 60¼ per cent of that produced in 1913. The production of forge iron on the other hand decreased to 35 per cent of the prewar output and that of bessemer pig to 34 per cent. The output of foundry iron in 1918 was only 45½ per cent of that in 1913.

Fig. 3, referring to steel output, shows even more interesting changes during the steel in 1918 was only 79¼ per cent of that turned out in 1913, nevertheless during this period of six years the output of electric steel increased to 287 per cent of the 1913 figure, from 88,881 tons to 240,037 tons. The most remarkable increase during the war, however, is found in the figures covering acid steel castings which increased from 109,329 tons to 759,266 tons, the latter being 697 per cent of the 1913 output. Basic steel castings on the other hand increased only 219½ per cent, while at the same time the output of basic-bessemer steel ingots decreased 40 per cent. Among the rolled products, the only one to show an increase between 1913 and 1918 are forging billets, the output of which increased to 157½ per cent of the 1913 production. Many other exceedingly interesting facts regarding the details of German iron and steel production are laid bare in Tables III and IV and Figs. 3 and 4; in fact these statistics may be said to develop clearly the intimate fabric of the industry.

Could Supply Own Needs

With further reference to the question of production, another extract from the semiofficial memorandum previously mentioned, dealing with pig iron, may now be presented. After pointing out that the production of pig iron in the German customs union, which included Luxemburg, was approximately 19,300,000 metric tons in 1913, the memorandum shows that 20 per cent of this tonnage came from Lorraine, 13.2 per cent from Luxemburg, 7.1 per cent form the Saar and 5.1 per cent from Upper Silesia.

"On this basis," the memorandum proceeds, "after the deduction of the production of the districts of Lorraine, Luxemburg, the Saar and Silesia, the annual output will be reduced by 8,700,000 tons, or 45.4 per cent. The remainder of Germany, therefore, will be able to produce about 10,600,000 tons of pig iron, provided the necessary iron ore can be secured. The actual total, however, will be considerably less on account of the decreased efficiency of the workmen, insufficient supplies of coke, etc. On the other hand, the consumption of pig iron in Germany and Luxemburg in 1913 amounted to about 17,000,000 tons. After deducting from this figure the consumption of Luxemburg, Lorraine, Upper Silesia and the Saar, the demand for pig iron in the remainder of Germany at the present time may be assumed to be about 10,000,000 tons per year. Germany would be able to produce this quantity provided normal economic conditions as regards coal,

Table VI

Official German Steel Prices 1913-1920

Statistics Prepared by German Foreign Office—Prices Are in German Marks Per Metric Ton at Official or Controlled Quotations

Year	Billets	Standard Rails	Beams	Plates, Tank, Car or Ship	Bars	Bands	Sheets, Under 3 Millimeters
1913[1]							
January	92.50	118.00		135.00	124.50		
1914							
January	87.50	118.00		103.50	98.50		
March	87.50	118.00		101.50	97.50		
May	87.50	118.00		100.50	95.50		
August	95.00	118.00		100.50	95.50		
October	95.00	118.00		.....	.....		
December	95.00	118.00		.....	.....		
1915							
January	95.00	114.00		.....	.....		
March	102.50	114.00		.....	135.00		
May	107.50	114.00		140.00	137.00		
August	107.50	114.00		150.00	142.50		
October	107.50	114.00		150.00	140.00		
December	107.50	114.00		145.00	135.00		
1916							
January	112.50	114.00		155.00	140.00		
March	112.50	114.00		175.00	160.00		
May	132.50	114.00		185.00	190.00		
August	132.50	114.00		195.00	195.00		
October	132.50	114.00		195.00	195.00		
December	132.50	114.00		195.00	195.00		
1917							
January	182.50	192.50		195.00	195.00		
March	182.50	192.50		195.00	195.00		
May	182.50	192.50		235.00	195.00	255.00	300.00
August	192.50	192.50	220.00	275.00	235.00	255.00	310.00
October	192.50	192.50	220.00	275.00	235.00	265.00	310.00
December	192.50	192.50	220.00	275.00	235.00	265.00	310.00
1918							
January	192.50	204.00	220.00	275.00	235.00	265.00	310.00
March	192.50	204.00	220.00	275.00	235.00	265.00	310.00
May	192.50	204.00	220.00	275.00	235.00	265.00	310.00
August	192.50	204.00	220.00	275.00	235.00	265.00	310.00
October	197.50	204.00	220.00	275.00	235.00	265.00	310.00
December	197.50	204.00	220.00	300.00	235.00	265.00	310.00
1919							
January	290.00	300.00	320.00	375.00	335.00	365.00	460.00
February	390.00	400.00	420.00	500.00	435.00	435.00	610.00
March	390.00	400.00	420.00	500.00	435.00	435.00	610.00
April	390.00	400.00	420.00	500.00	435.00	435.00	610.00
May	405.00	570.00	520.00	615.00	550.00	550.00	735.00
June	405.00	570.00	520.00	615.00	550.00	550.00	735.00
July	405.00	570.00	520.00	615.00	550.00	550.00	735.00
August	555.00	570.00	715.00	835.00	745.00	745.00	985.00
September	555.00	570.00	715.00	835.00	745.00	745.00	985.00
October	755.00	.....	965.00	1185.00	995.00	995.00	1385.00
November	800.00	.....	985.00	1185.00	995.00	995.00	1385.00
December	1465.00	.....	1750.00	2235.00	1745.00	1925.00	2610.00
1920[2]							
January	1465.00	.....	1750.00	2235.00	1745.00	1925.00	2610.00
February	2290.00	2755.00	3000.00	3435.00	2650.00	2900.00	4535.00
March	2290.00	2800.00	3400.00	3450.00	2650.00	2900.00	4535.00

[1]Marks at par, 1 M=23 4-5 cents. [2]Marks at 5 per cent of par, approximate 1 cent.

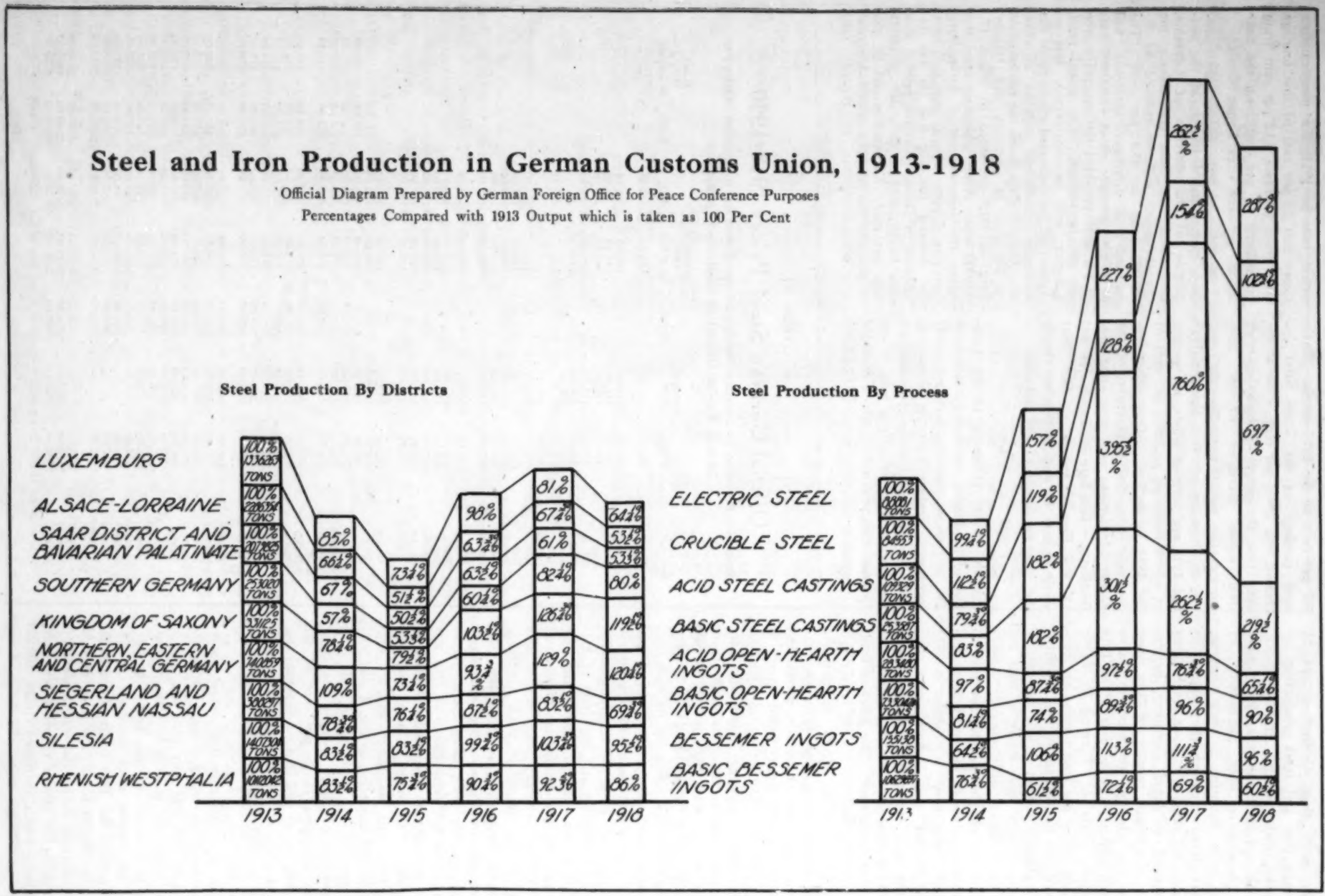

Steel and Iron Production in German Customs Union, 1913-1918
Official Diagram Prepared by German Foreign Office for Peace Conference Purposes
Percentages Compared with 1913 Output which is taken as 100 Per Cent
Steel Production By Districts
LUXEMBURG
ALSACE-LORRAINE
SAAR DISTRICT AND BAVARIAN PALATINATE
SOUTHERN GERMANY
KINGDOM OF SAXONY
NORTHERN, EASTERN AND CENTRAL GERMANY
SIEGERLAND AND HESSIAN NASSAU
SILESIA
RHENISH WESTPHALIA
1913 1914 1915 1916 1917 1918
Steel Production By Process
ELECTRIC STEEL
CRUCIBLE STEEL
ACID STEEL CASTINGS
BASIC STEEL CASTINGS
ACID OPEN-HEARTH INGOTS
BASIC OPEN-HEARTH INGOTS
BESSEMER INGOTS
BASIC BESSEMER INGOTS
1913 1914 1915 1916 1917 1918

FIG. 3—CHART SHOWING FLUCTUATIONS IN GERMANY'S STEEL OUTPUT FOR SIX YEARS ACCORDING TO DISTRICTS AND KINDS OF STEEL

transport and labor prevailed and that the requirements for iron ore could be satisfied by imports on a satisfactory basis. Such, however, is not actually the case and, therefore, for the time being the actual output of pig iron only covers about half the quantity needed."

Viewing the foregoing figures in general, it becomes plain how utterly dependent the German iron and steel business of today is on the goodwill of foreign nations controlling iron ore and other necessary raw materials. The industry of course is particularly dependent upon France, owing to the absolute necessity for the importation of a large amount of minette ore. The burden of a typical Westphalian furnace in March of this year consisted of 20 per cent of Swedish ore averaging 55 to 60 per cent iron; 20 per cent of Spanish red ore averaging 40 per cent iron; 20 per cent of German ore; and 40 per cent of minette ore with 26 to 30 per cent iron. The total burden therefore carried 38 per cent iron, and 40 per cent of the tonnage involved came from what is now the French territory. It is beginning to be realized, however, that Germany can only pay her debts and the reparation account by being permitted to re-establish her production to a degree at least, and it would seem therefore that France should facilitate the economic re-establishment of Germany, *if* the latter country makes it plain that she is ready to pay her debts in good faith.

New Altitude Records

Turning now to the question of prices, some extraordinary figures are encountered. A few were presented in the introductory article. Further details are presented in Tables V and VI. These quotations, which are given in German marks, speak for themselves. Although the increases during the war were continuous the price advance did not become feverish until the latter part of last year coincident with the collapse of German exchange. The latter has tumbled headlong in the past few months.

Last fall the average quotation on marks in five neutral centers, Zurich, Amsterdam, Copenhagen, Stockholm and Christiania, was 40 per cent of normal value; at the moment of writing it is something less than 5 per cent. In other words, it now requires 20 marks to purchase what one mark would buy outside of Germany in 1914. The effect of this terrific slump in exchange on iron and steel quotations has of course been prodigious. In fact, the fall in exchange was more quickly reflected in the prices asked for pig iron and steel products than almost anywhere else in Germany, due simply to the fact that so much of the raw material for steel manufacture must be imported at the present time. As the blast furnace burden mentioned above shows, some 80 per cent of the iron ore now being smelted comes from outside of Germany's new borders. While half of this, namely the Lorraine ore, is not paid for directly in cash, the remaining 40 per cent of the furnace burden must be so financed, since it comes from the neutral countries of Sweden and Spain. Here we find the real reason why foundry pig iron has advanced from 651 marks a ton to 1636 marks in the past six months, with corresponding increases in all other German iron and steel products. The cost of basic-bessemer pig iron produced in a modern furnace at Dortmund is now stated to be 1500 marks per ton against 58 to 60 marks in 1914. This iron contains 1.8 per cent phosphorus and 0.3 per cent silicon. Even *Abfall Eisen*, the waste metal recovered from the cupola drop in foundries, etc., is bringing 1300 marks per ton at present.

Before proceeding further with this discussion of prices, the reader should be warned against the false impressions which arise from attempts to translate German quotations into foreign monetary units at the present time. The mark has now sunk so low that such a procedure is virtually meaningless. It is possible of course to convert the *prices* into foreign money, but it is quite impossible to translate the values represented. It is not practicable therefore to reduce German prices to dollars except when dealing with export material. In any other case, the comparison of the equivalent dollar price of the German product, with American iron and steel quotations would lead only to the most erroneous assumptions. German economic conditions seem to have reached the stage where they are in fact beyond comparison with conditions in more stable realms. For instance, in 1914 could anyone have been discovered bold enough to say that pig iron would ever be sold in Germany for over 1600 marks a ton? Yet these prices and more actually being paid in spite of the fact that such quotations are far beyond what might be considered reasonable limits.

The equivalent dollar value of the German quotation on foundry iron is only about $16 a ton. This does not mean however that German pig iron is being sold today inside of Germany at less than half the price of the American product. In the first place it is extremely doubtful if the German quotation represents a fair profit to the producer. Furthermore, such profit as may be extracted virtually has no purchasing power compared with prewar times. The prewar equivalent of the present German quotation on pig iron is about $410 a ton. Such a comparison is of course utterly ridiculous. The real value of a ton of German pig iron today must lie somewhere between the two extremes of $16 and $410.

Foreign ore quotations are on a somewhat different basis, as this material has a definite value in stable currency, and the German buyer must produce a sufficient number of marks to enable the producer to realize his price. Spanish ore laid down at Westphalian steel works today costs about 1065 marks per ton for 50 per cent iron, of which 75 marks represents the Rhine freight from Rotterdam.

How the U-Boats Come Home

A similar situation surrounds the Swedish ore market. Before the war this product, which ranges from 50 to 60 per cent iron, cost 19 to 20 marks per ton delivered to Westphalian steel plants. Recently contracts have been made on the basis of 650 marks f.o.b. Rhine steel works, including handling, provided the ore is shipped in German bottoms at a freight rate of about 200 marks per ton. The surrender of German ships to the allies, however, may make this impossible; and if neutral or former enemy shipping is employed, the freight will be increased by 400 marks per ton, and the delivered price will therefore become 1050 marks.

The foregoing affords another opportunity to point out the incongruities which arise by attempting to translate these quotations into American exchange. The Swedish ore price mentioned above, 1050 marks, is about $10. The quotation on foundry pig iron, however, is only about $16 in American money, as previously stated, while the labor cost on a ton of pig iron is 22 marks or only about 20 cents. These figures of course when expressed in American equivalents cannot be reconciled.

German brown ore, low in manganese, is now quoted 61 marks per ton; red ore, 30 per cent iron, from the unoccupied province of Nassau is 35 marks per ton, while 45 per cent ore brings nearly twice this figure or 67.50 marks. It is practically impossible to obtain a proper quotation on minette ore in marks, since none has been purchased for cash. Virtually all the Lorraine ore which is coming into Germany at present is that which is being received under the coke exchange arrangement previously mentioned. On the basis of the price of the coke, Lorraine ore may be said to cost the German steelmakers somewhere in the neighborhood of 160 marks a ton.

The reservations regarding exchange value previously mentioned must also be applied to coke quotations which are shown in Table II. As these statistics indicate, furnace coke increased from

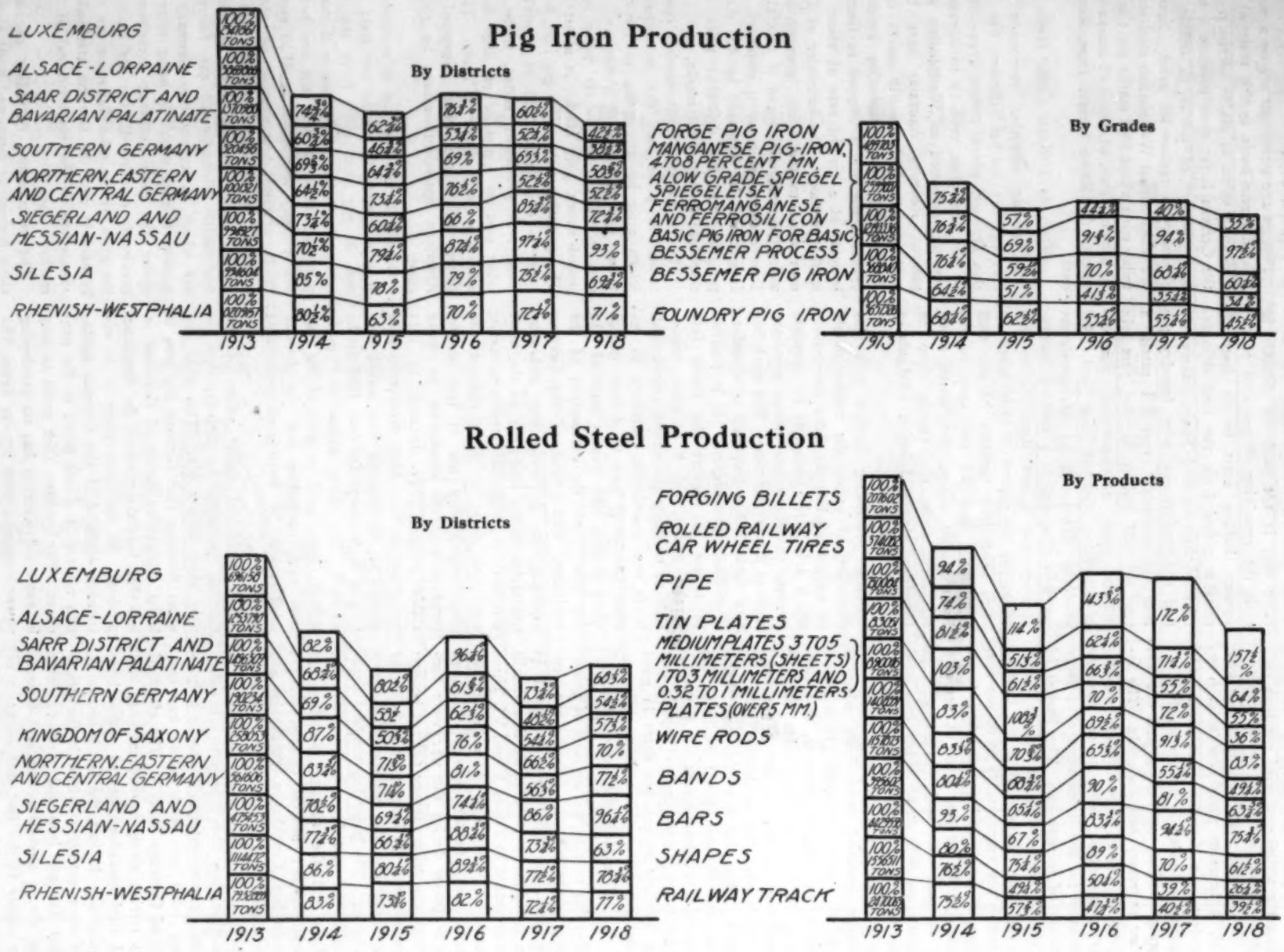


FIG. 4—CHART SHOWING FLUCTUATIONS IN GERMANY'S PIG-IRON AND ROLLED-STEEL OUTPUT ACCORDING TO DISTRICTS AND KINDS

16 marks a ton in 1914 to 126 marks in March, 1920. In the same way the prices of the best Ruhr coal have advanced as follows since the beginning of the war: July, 1914, 13 marks; December, 1919, 97 marks; January, 1920, 118 marks; February, 1920, 160 marks; March, 1920, 250 marks. The coke prices are out of line due to the fact that such a large proportion of the steel works control their own mines. Also in the confused situation which now exists, it is impossible to maintain consistent quotations.

In addition to the fact that his coke costs eight times as much as it did before the war, the German blast furnace manager is unable to obtain fuel approaching the prewar quality. The ash in the coke today ranges from 12 to 15 per cent as compared with an average of 9 per cent in 1914. As a result, the coke consumption of a modern Westphalian furnace has increased from 1100 kilograms per ton of pig iron in 1914 to 1300 kilograms at present. Furthermore, owing to the high ash it is difficult, when making basic iron, to keep the silicon from running up, and it now frequently reaches 0.6 per cent or double the normal amount. This in turn increases the difficulties of the operator of the basic bessemer converters.

No Paper Shortage

One of the principal underlying causes of the tremendous price revolution which Germany is experiencing is found in the outrageous increase in the volume of paper money issued by the government in its effort to keep pace with the falling mark. Another factor is the greatly decreased production of essential commodities such as coal, iron, steel, etc. The effect of this decreased production, moreover has been augmented by the ruinous system pursued during the past year of exporting at, or only a little above, domestic mark prices, while importing food, etc., at the much higher world-market prices. This policy of exporting may of course be justified on the score of necessity, and judging from the shortage of food now prevalent in Germany it seems doubtful if effective reforms can be introduced. The population must be fed at all hazards or mob rule and anarchy are as certain as the sunrise. Nevertheless, as a result of free exports and decreased production, there has been brought about within Germany an exhaustion of commodities such as the world never before has witnessed. It is difficult indeed to appreciate, without seeing it, how poverty-stricken the German nation really has become.

As a result of the necessity for maintaining food and iron ore imports in spite of this poverty, some very unusual market tactics have developed in the German iron and steel trade. One of the reasons for the comparative strength of the German iron and steel industry lies in the efforts which its leaders are making to feed their employes. All of the large companies maintain more or less completely organized provisioning departments and special efforts are constantly being made to improve the rations of their workmen. It has been found that this is the most potent weapon available for combating excessive wage demands, disorders, strikes and other serious labor situations. As a result, it is the exception rather than the rule in Germany at the present time, to sell iron and steel products simply for cash. Some form of barter is usually introduced into the transaction.

In the first place the official prices quoted in the tables accompanying this article represent delivery at the convenience of the producer, in other words, from 8 to 12 months hence. To really get any steel within a reasonable time the buyer must be prepared to offer premiums of varying amounts ranging up to about 3000 marks per ton. As much as 4000 marks per ton has recently been paid for ship plates by builders anxious for early deliveries, while hematite pig iron has brought 3000 marks. It is practically impossible, however, to make up any schedule of actual quotations which would include the premiums and, therefore, represent the real market for prompt shipment, because of the great price spreads encountered. The premium is strictly a matter for negotiation between the buyer and seller and may range anywhere from 500 to 3000 marks depending on the necessities of the respective parties to the contract.

But the purchase of iron or steel in Germany is by no means as simple as the foregoing would indicate. In the first place the producer, owing to the prevailing shortage of raw material, frequently demands half of the tonnage involved in the form of scrap, for which of course a certain allowance, subject to negotiation, is made in the price of the finished product. Therefore a shipbuilder seeking 5000 tons of plates would very likely be called upon to furnish 2500 tons of scrap.

Demand Foreign Exchange

In addition, food and exchange conditions are such that the German steel producers are very reluctant to deal exclusively in marks and the buyer in almost every case is asked to furnish a proportion of the price in foreign money, preferably Swedish, English or American. The amount paid for in this manner varies according to the details of the negotiation. The big German iron and steel syndicates, however, recently have adopted a regulation which calls for at least half of the price in foreign exchange. The steelmaker of course uses these foreign credits to pay for his iron ore imports and also to buy food for his employes.

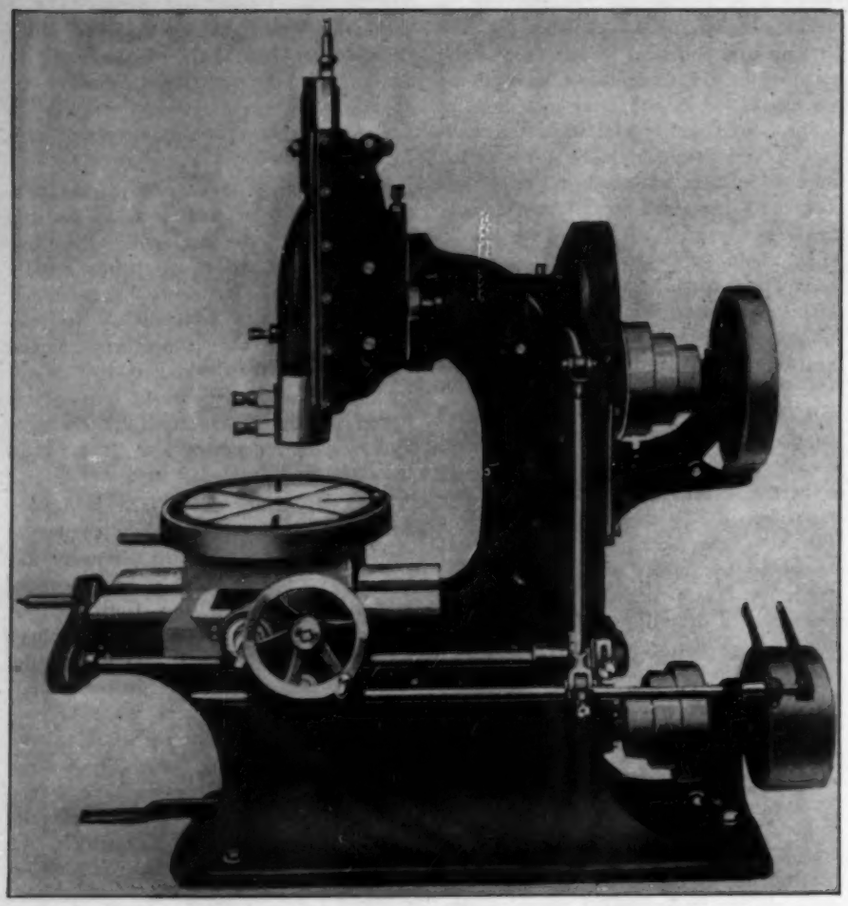
All semblance of orderly market procedure has been swept aside by the necessities of the moment. Primitive conditions of barter are being rapidly restored and this tendency has been accelerated by the collapse of German exchange and the consequent partial breakdown of the banking system. Contracts for future delivery at fixed prices have entirely disappeared. Both producers and consumers live from hand to mouth and from day to day.

The expedients which are being resorted to at present certainly emphasize the economic chaos which Germany has brought upon herself as a result of the war. Today when the German producer of steel comes to sell his product he no longer thinks of it in marks, the medium of exchange of his own country; rather he measures what he can get for his output in terms of additional raw material, scrap, credits in foreign banks, and food. Here we have indeed the true measure of defeat, from the complete consequences of which the world must, for its own sake, wish Germany to escape, through the constructive efforts of industries like that of iron and steel.

Publish 1920 Edition of Commercial Register

The twenty-eighth annual edition of *Hendricks' Commercial Register of the United States for Buyers and Sellers* for 1920, which has just been published by the S. E. Hendricks Co., New York, contains several improvements over previous editions. The most noticeable is the new method of exterior indexing by coloring the front edges red, white and blue to indicate the different main sections of the book.

The trade index comprises a section of 162 pages in which every product listed in the book is indexed and cross indexed for ready reference. The main classified trades list covers 1813 pages, listing over 18,000 different products. The present edition contains over 1200 new headings, including many headings completely covering the chemical industry. The third section of the book consists of 216 pages listing the trade names under which products are manufactured, with the name and address of the manufacturer. Another section of 487 pages containing all the names in the



NEW 6½-INCH CONE DRIVEN SLOTTER WITH AUTOMATIC FEEDS TO SLIDES AND TABLE

book in one alphabetical list with addresses, and their main line of business. This is followed by the index to advertisers of 20 pages, containing a full list of branch and foreign offices following each name. The whole makes a volume of 2703 pages.

Introduces Novel Slotter in United States

A 6½-inch cone-driven slotter of new design is being introduced in the United States by Alfred Herbert Ltd., 54 Dey St., New York. This machine, which is manufactured by Harry F. Atkins, Old-Fletton, Peterborough, Eng., is equipped with automatic feeds to both slides and to the circular table. The table is of unusually large diameter, is graduated in degrees and has a locking device with 12 divisions. The ram can be swiveled to obtain taper keyways or for other taper work. The tool holder which is of the clapper type is universal in movement. The gears are mounted to insure protection against dust; a treadle brake is provided; and the countershaft is self-contained.

The stroke of the ram is 6 inches while the maximum dimensions of the work accommodated by the machine, are 7½ inches for depth and 30 inches in diameter. The longitudinal traverse and the traverse travel each are 12 inches. The machine is capable of making from 26 to 77 strokes per minute and may be adjusted for feeds ranging from 0.004 to 0.024 inch. The diameters of the 3-step cone pulley are 10, 8 and 6 inches, respectively, and the countershaft pulley, having a diameter of 12 inches, runs at 270 revolutions per minute.

Machine Cuts and Levels Sheet Metal Strips

Cutting sheet metal into strips for various manufacturing purposes is sometimes an expensive procedure wherein the results are not always satisfactory. In some cases, the edges of the strips are not parallel which necessitates another trimming operation. To overcome these difficulties and to provide rapid means for cutting sheet metal into strips, the Yoder Co., Cleveland, recently designed the unit shown in the accompanying illustrations.

These machines are made in several sizes to accommodate various widths and thickness of metal. The machine shown in Fig. 1 is the regular size while Fig. 2 illustrates a heavy duty machine. With adjustable cutters, strips 2 inches and wider can be cut on all machines designed to accommodate ⅛-inch metal. When the metal is thicker than ⅛-inch, 3 inches is the smallest width that can be handled. Where narrower strips are required solid cutters and spreaders are used.

The machine is equipped with long guides at the entrance side which keep the metal straight as it is fed between the rolls that carry it to the cutters. These rolls also keep the metal in a horizontal position while it is being cut. Guides are provided between the

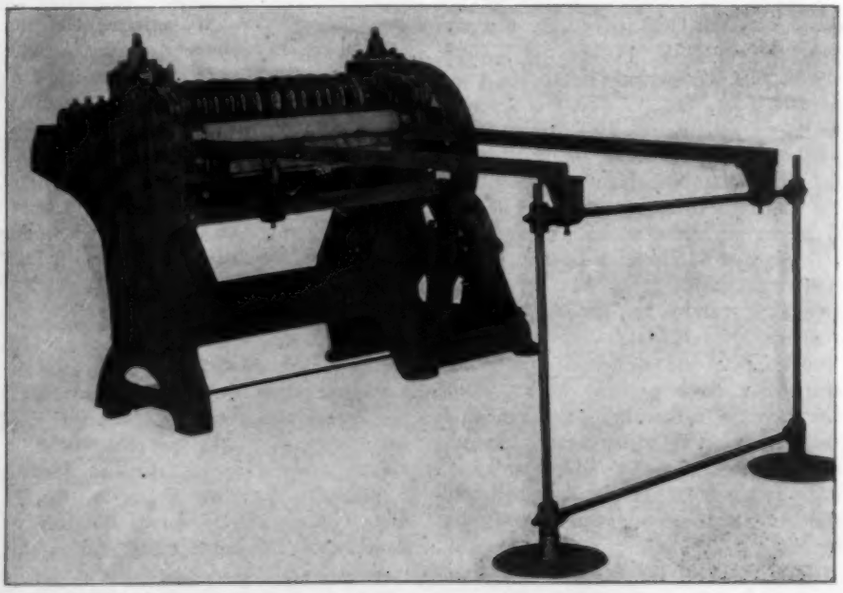


FIG. 1—ROTARY CUTTER UNIT FOR SLITTING SHEET METAL

feed rolls and the cutters to insure the proper entrance of the sheet. The slitting cutters are so arranged on the shaft that stretching of the edges of the strips is overcome. This feature, it is pointed out, keeps the strips from winding.

The cutters are tool steel and segment shaped, each being one-half a circle. They are fastened securely to a cast iron hub, threaded for its entire length. As the shaft is threaded also, this feature insures a positive grip as the two sections of the hub are drawn tightly together by bolts. This arrangement provides a bearing on the entire circumference of the shaft and also permits the cutter heads to run without wobbling. The threaded shaft also provides a ready means for adjusting the cutter heads for close measurements.

Finger guides are arranged immediately after, and to the side of the cutters, between which the slitted strips pass, to a pair of rolls which remove all burrs. Then the metal passes through a series of six straightening and leveling rolls. The machine is said to be economical in operation as it does not require the services of a highly skilled mechanic to operate it.

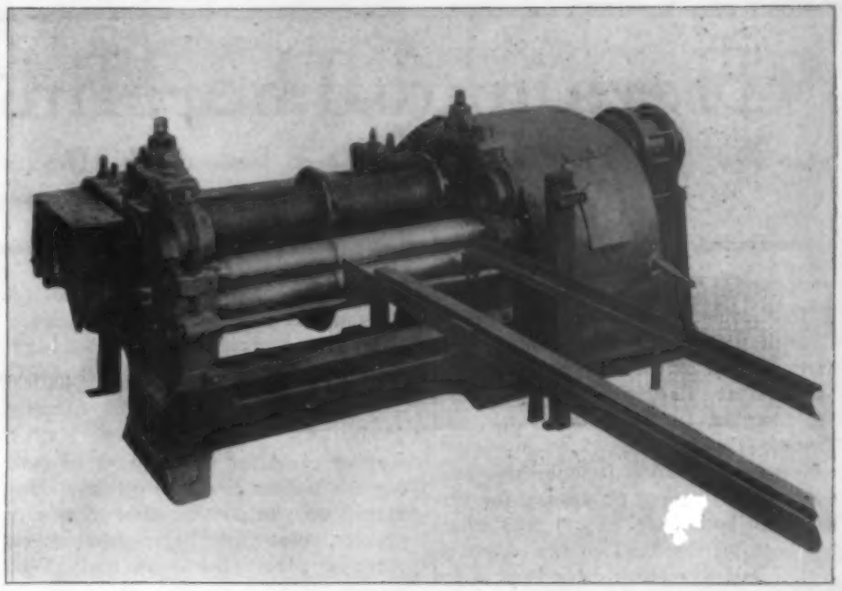


FIG. 2—HEAVY DUTY TYPE OF MACHINE FOR CUTTING METAL STRIPS

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

STANDARDIZATION in the manufacture of gears, is one of the important subjects to be discussed at the fourth annual meeting of the American Gear Manufacturers association, which will be held in the Hotel Statler, Detroit, April 29, 30 and May 1. An entire day of the convention will be devoted to the various angles of this subject, and reports will be given by committees which have had it under consideration for months. The program will include the following papers: "Gears from a Purchaser's Standpoint," by D. G. Stanbrough, Packard Motor Car Co., Detroit; "Routing of Gears and Machine Parts Through the Factory," by J. A. Urquhart, Browne & Sharpe Mfg. Co., Providence, R. I.; "The Science of Manufacturing," by Henry M. Leland, president, Lincoln Motors Co., Detroit; "Problems of the Gear User," and "Mill Gearing from the User's Standpoint." At the annual banquet to be held on the evening of April 30, F. W. Sinram, president of the association, will be toastmaster, and Edgard A. Guest, of the *Detroit Free Press*, and Henry W. Leland, president of the Lincoln Motors Co., will be the principal speakers.

* * *

A. F. A. Adds Nonferrous Section

At the annual meeting of the American Foundrymen's association to be held in Columbus, O., Oct. 4-8, inclusive, the program will include for the first time a separate section devoted to the nonferrous casting industry. At the meetings of this section, papers and discussions of interest to practical brass and aluminum foundrymen will be presented.

It is understood that the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers, will hold a meeting in Columbus during the same week and it is proposed to have joint sessions of the nonferrous section of the American Foundrymen's association and the Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers.

C. S. Koch, president of the American Foundrymen's association, has appointed Lucien W. Mueller of the H. Mueller Mfg. Co., Decatur, Ill., and Robert S. Archer of the Aluminum Manufactures, Inc., Cleveland, as members of the papers committee to represent this new section.

* * *

A. S. M. E. Announces Program

According to an announcement by the American Society of Mechanical Engineers the tentative program of the spring meeting to be held at St. Louis, May 24-27 is unusually attractive. Monday, May 24, will be devoted to registration, committee meetings and a reception in the evening with addresses by the governor of Missouri and the mayor of St. Louis. A business meeting will be held Tuesday morning and in the afternoon a trip of inspection will be made to the plants of the Commonwealth Steel Co. and the St. Louis Boat & Engineering Co. Mississippi steel barges are under construction at the latter plant. In the evening the usual banquet will be held. Among the speakers are Lieut. Col. H. W. Miller and Lieut. E. R. Jackson, United States army. Wednesday morning simultaneous sessions on aeronautics and foundry practice will be held. In the afternoon a session on appraisal and valuation and excursions to a number of manufacturing plants will be held. In the evening a special entertainment will be given in the municipal open air theater at Forest Park. Thursday morning a number of simultaneous sessions will be devoted to technical subjects and in the afternoon a boat trip on the river will afford the visitors an opportunity to inspect the filter basins and pumping plants of the city.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

INCREASED demand for its products has compelled the Link-Belt Co., with general offices in Chicago, to carry out an extensive program of expansion at its works in Chicago, Philadelphia, Indianapolis, Seattle, and Toronto, Ont.

New manufacturing facilities have been added to the several plants, and the personnel of both factories and sales offices has been increased. Two new furnaces, Nos. 7 and 8, recently have been added to the Indianapolis chain works and announcement of the purchase by the Link-Belt Co., of the Fairmount Foundry, Philadelphia, was made a few days ago by President Charles Piez. This deal involved several hundred thousand dollars and the foundry will be used as an adjunt to supply the eastern works at Philadelphia, with gray iron castings.

A new administration building is under construction at the Philadelphia works, and plans are being made to erect another such building at the Chicago works, to make room for enlarged engineering, sales, drafting, and clerical staffs. A conveying system is being installed in the foundry at the Chicago works to speed up output. The shops at Toronto and Seattle are being expanded to take care of the steadily growing business in those regions. A new warehouse is under construction at Seattle. The Toronto shops and offices shortly will occupy new quarters there.

* * *

AN INCREASE in capital stock from $15,000 to $200,000 by the Automatic Carbonic Machine Co., Peoria, Ill., is for purposes of expansion, although the erection of a plant until the high prices of materials and labor have subsided somewhat is not contemplated. The company, however will buy machine tools from time to time and hopes eventually to erect brass and iron foundries, precision and heavy machine shops, tank shop, etc. It also may be obliged to manufacture its own carbonic gas. The company manufactures carbonic refrigerating machinery in all sizes from 500 pounds to 500 tons. At present it is installing an 80-ton machine in the Madison Theater, Peoria, for air cooling purposes and a 45-ton machine in the bottling works of A. Wagener & Sons, Detroit.

* * *

WITH a paid-in capital of $400,000, the Federal Forge Co., Lansing, Mich., will operate a belt-hammer forging plant for the purpose of making the lighter line of forgings. Hammers up to 2000-pound capacity, presses, etc., will be purchased for the new plant now being built. Temporary offices are maintained in the American Savings Bank building and officers are as follows: President and general manager, M. R. Carier; vice president, Clarence E. Bement, secretary and treasurer, John P. Hopkins. These with Hugo Lundberg, S. H. Carpenter, Harry Harper and B. S. Gier constitute the board of directors. A. B. Shuart is general superintendent.

* * *

THE Trumbull Steel Co., Warren, O., has placed a contract with the Fuller Engineering Co., Allentown, Pa., whereby the latter will remodel the powdered coal installation at the Trumbull plant. The Fuller company will replace the present equipment with two 57-inch gear-driven mills, and a 5½ x 42-inch, indirect fired drier with the connecting parts. The powdered coal from the Fuller mills will be transported by a pumping system of the Fuller-Kinyon type, to the pulverized coal bins located at the furnaces. At the bottoms of the hoppers will be attached screw feeders and motors of standard design for mixing the coal dust and air for projection into the furnaces.

* * *

BLOWERS, grinders, cupola and monorail systems are included in the present requirements of the Canton Pattern & Mfg. Co., Canton, O., which recently was incorporated with a capital of $100,000. This incorporation was arranged for the purpose of expanding the business to include the manufacture of gray iron castings. It will erect a new foundry and pattern shop on a site in the center of Canton's industrial section. In the meantime, the business will be conducted from the old address, 920 Market avenue, south. The company hopes to have its new foundry in operation by June 1. Officers are as follows: President and treasurer, Theo. M. Dubs, and secretary and general manager, Edw. R. Starkey.

* * *

THE Iron Trade Products Co., Farmers' Bank building, Pittsburgh, has been appointed exclusive sales agent for the Connellsville-Fairmont Coal Co.'s mines at Worthington, W. Va., on the Baltimore & Ohio railroad.

* * *

FOR the manufacture of grinding wheels, the Precision Grinding Wheel Co., 1215 Filbert street, Philadelphia, is erecting a new building at Holmesburg, Philadelphia, on the main line of the New York division of the Pennsylvania railroad. This 100 x 300 foot plant will employ all of the four processes of grinding wheel manufacture, namely vitrified, silicate, shellac and rubber and using aluminous and silicon carbide abrasives. The main part of the building will be of sawtooth type, one story high and the remainder, two story, all of concrete and brick construction. It will occupy a 7½-acre site and will be served by a private railroad siding. The plant will be modern in design and equipped with the latest improved appliances. Operations are expected to commence July 1.

* * *

EXTENSIONS being made to the plant of the Martin Steel Products Co., Mansfield, O., include a new structural steel building, 100 x 300 feet of the monitor type. This building is being erected on a new site and is the first of a number of units which ultimately will be constructed. The first unit will give the company a capacity for 1920 of approximately $1,000,000 of output or about two and one-half times more than in 1919. Some new equipment will be purchased, a number of machines already having been ordered. The company now is in the market for a large geared press, capable of gang punching 36-inch x 11-foot sheets. Contracts for the building have all been let with the exception of the heating plant. A hot blast system is contemplated.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

NEW interests have acquired the Covington Machine Co., Inc., Covington, Va., founder and machinist. The plant has a well equipped machine shop and foundry. It manufactures coal leveling and coke drawing and loading machines for beehive ovens; punches, shears, bending rolls and other equipment. The foundry produces small brass castings, gray iron castings weighing up to 20 tons. The new officers are as follows: F. U. Humbert, president; F. W. King, vice president; G. W. Lipscomb, secretary and treasurer; and E. H. Archer, manager.

* * *

HAVING sold its former plant and equipment the Cook-Lewis Foundry Co., Inc., Greensboro, N. C., has a new plant under construction in that city. The main steel and terra cotta building will be 40 x 75 feet, exclusive of core room, casting sheds and pattern storage building. The core and molding rooms will adjoin the main building and will be 30 x 75 feet, while the pattern storage building will be entirely separate. Temporary quarters will be occupied until April 15, when the company hopes to continue the manufacture of gray iron, brass, bronze and aluminum castings in quantity. Officers are as follows: A. R. Lewis, president; E. J. Lewis, vice president; C. H. Lewis, secretary and treasurer, and the capital stock remains at $50,000.

* * *

RECENT orders received by the Electric Furnace Construction Co., Finance building, Philadelphia, include a 1-ton electric furnace for the Wayne Steel & Iron Co., Croghan, N. Y. Foreign orders are more numerous and the following recently have been booked: One 20-ton furnace for steel ingots for Stora Kopparbergs Bergslags Aktiebolaget, Domnavet, Sweden; two 10-ton for steel ingots, from the Societe Metallurgigue de la Loire, St. Etienne, France; one ½-ton for castings for S. A. C. Electriques de Charleroi, Belgium; one ½-ton for tool steel for the Carlisle Steel Co., Sheffield, England; and one 1-ton for steel castings for Sproat Marley & Co., Newcastle, England. Announcement also is made that the metallurgical section of Sheffield university, Sheffield, England, has decided to install one ½-ton electric furnace for experimental work on tool steels and on iron melting.

* * *

THE Sheet Metal Mfg. Co., with offices in the Home Savings and Loan building, Youngstown, O., have made application for an increase in capitalization from $50,000 to $250,000. Future plans of this company call for the erection of a fabricating plant and warehouse to be located in the Youngstown district.

* * *

FORMED for the purpose of manufacturing sheet metal specialties, the Metal Basket Works, Lafayette, Ind., has a capital stock of $100,000. The company has purchased the entire assets of the Sanitary Metal Basket Co., including the plant, good will and patents. The latter include patents on metal delivery baskets and patent rights to the rim grip tire carriers for Ford automobiles. The plant is fully equipped for the manufacture of factory tote boxes, steel barrels, metal trays, etc. W. S. Crum, formerly president of the Sanitary Metal Basket Co., also is president of the Metal Basket Works; W. F. Sheets, likewise of the former organization is vice president, and J. E. Bellinger is secretary and treasurer. Present equipment needs include No. 1 and No. 2 and heavier punch presses, wire straighteners, bending machines. The company also is in the market for black and galvanized sheets in carload lots.

* * *

THE All-Steel Supply Co., Youngstown, O., which has been formed under the leadership of J. E. Fitzgerald and A. E. Queer for many years with Brier Hill Steel Co., has acquired the old American Sheet & Tin Plate Co. property in Niles for erection of a plant scheduled to be in operation by early summer.

The company is to be capitalized for $250,000 and the directorate will include some of the leading steel men in the valley, according to those back of the project. Temporary offices have been opened at Niles and announcement is made the contract for the first unit of the plant has been let; completion being scheduled for May 15.

The plant will be erected on a 20-acre site, which will permit expansion. The company will manufacture sheet steel products and, also, do a jobbing business.

* * *

SPECIALIZING in pistons, piston pins and cast iron head valves and other automotive parts, the Powelson Foundry & Machine Co., Inc., 304-320 Franklin street, Rochester, N. Y., recently was organized with a capital of $200,000. It has purchased the foundry and equipment of Josiah Anstice & Co., that city, and has placed orders for machine shop equipment. Operations are expected to commence about April 15. Officers have been elected as follows: President and general manager, J. W. Powelson, recently works manager for the Pittsburgh Model Engine Co., Pittsburgh; vice president and treasurer, F. C. Kimmel, recently president and general manager of the Rochester Motors Co., Inc., Rochester. Both will now devote their entire time and attention to the affairs of the new company.

* * *

FOR the purpose of manufacturing and selling electrical and mechanical appliances, principally electrical equipment for central and substation powerhouses, the Erie Electrical Equipment Co., Inc., Johnstown, Pa., has taken over various patents granted to H. A. Selah. These patents cover threadless pipe fittings used in pipe frame structural work, together with fittings for mounting high and low tension insulators to pipe frame structures. The new company is incorporated at $25,000 but probably will be increased shortly, since it is the intention of the company to erect its own malleable iron foundry to produce castings now bought elsewhere. The officers follow: President, John L. Hershberger; vice president, S. A. George; secretary and treasurer, H. A. Selah. The principal office and factory are located at 618-620 Elder street, Johnstown, Pa.

Unions Attack Industrial Report

President Reported To Be Withholding Approval of Board's Recommendations, While Senate Committee Hears Opponents and Champions of the Measure — Compromise Legislation May Lean to War Labor Board System of Settlements

WASHINGTON, April 13.—Strong opposition to the report of the second industrial conference for preventing and adjusting labor disputes has developed. Representatives of organized labor and those supporting its policies contend that the report, while creating machinery to handle labor problems, fails to establish principles for its operation.

Because of a controversy over the report the senate committee on education and labor, of which Senator William S. Kenyon, Iowa, is chairman, has begun hearings without waiting for any recommendations from the President as to legislation, and hopes to frame a bill which probably will represent a compromise between suggestions made in the conference report and those advanced by organized labor. It is reported that in view of the attitude of the American Federation of Labor, the President has concluded to withhold approval of the report.

Organized labors' suggestions are said to be more nearly represented in the bill introduced last January by Senator Kenyon than they are in the conference report. Broadly, the former plan would set up a tribunal like the war labor board, with industrial instead of regional bodies selected to prevent and settle labor troubles.

The first hearing before the senate committee was held last Thursday when William Jett Lauck, who was secretary of the war labor board, appeared as a witness. The investigation will be resumed this week, and among the witnesses asked to appear are former President Taft, who headed the labor board; Herbert Hoover, a member of the second industrial conference, and Samuel Gompers. Others will be called later, among them large employers, if they care to present their suggestions.

Mr. Lauck virtually asked for the rejection by congress of the report of the industrial conference. He contended that it failed to give just recognition to labor; that "it failed to use trade unionism as a basis for collective bargaining," and that it did not provide any principles on which to base settlements. He urged that the principles of the war labor board be accepted as a basis of legislation instead of the industrial conference report. It will be recalled that the committee on education and labor made such a recommendation in its report on the steel strike. Therefore, it would not be surprising if it proposes such legislation, following lines already laid down in the measure introduced by Senator Kenyon.

Mr. Lauck held that the conference's proposal for regional tribunals places the question on a geographical instead of an industrial basis and fails to create boards acquainted with problems peculiar to the different industries involved in disputes. The regional tribunals, it was contended, are to hear cases on appeal and only on question of fact. Not only did the conference fail to lay down principles of policy, it was claimed, but it barred the tribunals from establishing them. It also was held that the conference regards shop committees as being entirely distinct from local unions and deprives the latter of certain functions in negotiating and bargaining. This is considered the most vital objection of organized labor to the conference report.

Congress Is Urged to Help Increase Immigration

New York, April 12.—That the labor supply of the country may be increased, the Inter-racial conference has endorsed a memorandum to congress requesting a revision of the immigration laws, under which it would be easier to admit and assimilate aliens. John E. Otterson, president of the Winchester Repeating Arms Co., referred to the lack of immigration during the war in his address before the general mass meeting called by the Inter-racial conference, Wednesday, saying:

"Before the war we had about 1,250,000 immigrants per year coming into this country, and to this number about 30 per cent were of the unskilled laboring class. Since the war we have had about 250,000 immigrants a year and of this number about 35 per cent have been of the unskilled class. As a result of this condition we are today about 4,000,000 short in immigrant labor."

The latest figures on immigration show that there is an actual deficit despite the high wages and the ease with which foreigners can now find employment in the United States. The figures show that between Nov. 1, 1918, and Nov. 1, 1919, the number of immigrants arriving in the United States totaled but 201,473 as against 214,421 emigrants.

The large employers of labor, the representatives of racial classes in the United States, state and federal officials who participated in the meeting drafted a memorandum to congress requesting the repeal of the literacy test in the immigration laws and the creation of a federal board on assimilation of aliens. Speeches endorsing this were made by Gen. Coleman du Pont, chairman of the board of the Inter-racial council; William H. Barr, president of the same body; Arthur S. Somers, president of the board of education of New York City; John H. Finley, president of the University of the State of New York; Paul M. Warburg, formerly member of the federal reserve board; F. Charles Schwedtman, of the National City bank; Louis Marshall, former chairman of the New York state commission of immigration; Carl Giesse, of the Cleveland Trust Co., and others. It was pointed out that the literacy test prevents the entrance of aliens who would take positions as farm laborers, domestic servants and common laborers. A resolution of patriotism was adopted, designed to dispute any allegations of initiating propaganda to create political or industrial unrest.

The federal board of assimilation would be charged with the duty of co-ordinating all existing governmental activities relating to immigration, of facilitating the safe and expeditious distribuiton of immigrants of supplying them with information and assistance in respect to the securing of employment, of affording them instruction in the English language and in the history, customs and institutions of our country, and of protecting them against fraud and exploitation.

The employes of the Worcester, Mass., works of the American Steel & Wire Co. subscribed for $434,000 worth of preferred stock of the United States Steel Corp. at $106 per share.

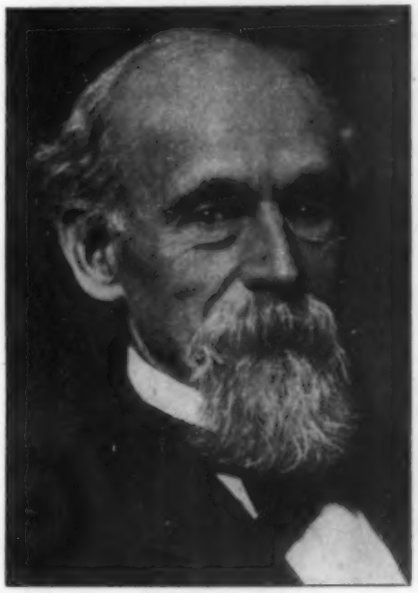
Obituaries

JOHN A. BRASHEAR, scientist, astrologist, inventor, apostle of precision, past president of the American Society of Mechanical Engineers, and chairman of the John A. Brashear Co., Pittsburgh, died April 8, at his home in Northside, that city, in his eightieth year. He was widely known as "Uncle John" to Pittsburger's. Death followed a 6-months illness, which was superinduced by an attack of ptomaine poisoning. About two weeks prior to his death, congestion of the lungs developed and diminished his strength.

Born in Brownsville, Pa., Nov. 24, 1840, Mr. Brashear obtained his education in the public schools there and as a boy, was apprenticed to a manufacturer of steamboat engines as a wheelwright. He removed to Louisville, Ky., in 1860 and followed his trade as machinist. One year later he became a millwright in the iron mill of Zug & Painter, Pittsburgh, and for the next 20 years was closely associated with rolling mill work. Ever since he had a glimpse of the stars through a telescope on the streets of Brownsville when eight years old, Mr. Brashear had devoted much of his spare time to his hobby, astronomy, resolving at that early date to learn all possible concerning the heavens. When he built his own home in 1870 after working hours he erected a small workshop adjoining and in 1875, he completed his first telescope, making the tubes and grinding the lenses with home-made machinery. He continued with the mills for five more years, leaving Zug & Painter and going to the glass mold plant conducted by Adams & Co. Experience gained here, helped him in his subsequent telescopic work. His experimental work on telescopes continued and improvements constantly were made. In 1880, he turned wholly to the manufacture of instruments, organizing the John A. Brashear Co., with his son-in-law, James B. McDowell, in which work he continued until his death. His spectroscopes and spectrographs have made him famous all over the world.

Perhaps his most noteworthy achievement has been in connection with the design and development of the spectroscope for astronomical uses, particularly with reference to the mechanical features. In 1888, he completed the spectroscope for the 36-inch telescope of the Lick Observatory, furnishing the mechanical parts and at the same time, a complete small spectroscope, including the prisms and all other optical parts, which were conceded to be of higher grade than those previously obtained in Germany.

Mr. Brashear became a member of the American Society of Mechanical Engineers in 1891, was elected an honorary member in 1908, was its manager from 1899 to 1902, and in 1914 was elected its president for the



JOHN ALFRED BRASHEAR

1915 term. He also was a member of the following societies: Royal Astronomical Society of Great Britain, Royal Astronomical Society of Canada, Societe Astronomique de La France, Societe Astronomique de Belgique, American Philsophical society, American Association of Science, American Astrophysical society, Astronomical Society of the Pacific, Pittsburgh Academy of Science and Art, Engineers' Society of Western Pennsylvania, having served that body as president for a term, and the National Geographic society. He was the recipient of honors from many of the foremost engineering institutions of this and other countries. The degree of doctor of laws was conferred upon him by Washington and Jefferson college and by Wooster university, and the degree of doctor of science by Princeton university and the University of Pennsylvania.

Honorary pallbearers were Frank Nicola, Charles M. Schwab, John Walker, Dr. A. A. Hamerschag, Gen. Richard Hoxie, Ambrose Swasey, Charles Taylor, W. H. H. Hilliard, Andrew Mellon, William McConway, John W. Beatty, Robert Franks, Taylor Allderdice, Karl Reinholt, S. H. Church, W. H. Naughton and two members of the Henry C. Frick educational commission.

David N. Balderston, Elizabeth, N. J., died recently at Philadelphia. He had been connected with the Electro Dynamic Co., Bayonne, N. J., as engineer and superintendent of the axle light department of that company's plant for about 22 years.

Alfred Nelson Hargrove, son of a Birmingham, Eng., steel manufacturer and former foreign sales representative of the J. G. Brill Car Co., Philadelphia, died March 27 at the St. James hotel annex, Philadelphia.

James J. Dalton, who was employed by the Rail Joint Co., department of the Illinois Steel Co., Joliet, Ill., for 20 years, died at his home in that city recently. For the past 13 years he had been stationed as manager at Joliet.

W. I. McMillan, connected with the American Radiator Co., for about 19 years, latter as manager of its Cincinnati branch, died in that city, recently. He was about to leave for his health's sake on a southern tour, when he suffered a nervous breakdown which resulted in his death.

Robert Whitelaw, a pioneer manufacturer of Woodstock, Ont., died on April 7, at the age of 93. He was born in Scotland and came to Canada when a young man. He established the Whitelaw foundry in Woodstock about 44 years ago. He took an active interest in civic affairs.

Michael R. Conway, head of Conway & Co., Cincinnati, manufacturers of patent friction clutches, died at his home in that city, recently. For over 40 years he had engaged in the machine tool manufacturing business in Cincinnati. He was the inventor of one of the first power lathes manufactured and he also invented a log cutting bandsaw.

Lifting of Tax Burden Deferred

Both Parties Would Like to Reduce Cost of Living Before Presidential Campaign, but There Are Other Considerations—Republicans Fear the Veto and Democrats Fear Substitute Tax on Sales—Amendments Favored to Prevent Increases "All Along the Line"

WASHINGTON, April 13.—Republicans of the house committee or ways and means who have begun conferences looking to a revised taxation program have admitted that no effort will be made at the present session of congress to enact any legislation. It is not probable that any will be attempted, at least by the republicans, during the incumbency of the present administration. The republicans point out that the President would probably veto any legislation that they might put through, and therefore they could accomplish nothing. However, the administration, as represented by the treasury department, and the republicans are in agreement that a number of administrative features of the present revenue law should be simplified, and efforts now are being made in that direction. The amendments may be made before congress recesses or adjourns which it is likely to do soon before the republican national convention in Chicago in June.

Because of the effect it might have on the presidential campaign, both parties would like to readjust taxes to bring down the cost of living, but neither is able to see how this can be done in view of the enormous obligations and expenditures of the government. On the other hand leaders in congress have sought vainly to devise a way of raising tariff revenue without having the increased cost passed to the public. It is generally agreed that the excess profit taxes, which, it was estimated would bring $1,100,000,000 to the government, taxes several times that amount from the consuming public. While ultimately the excess profit taxes are to be done away with, according to leaders in congress, the leaders are far from being in accord as to the substitute that should be adopted. Talk has been heard of devising a tax on retail sales but it is recognized that this would be an extremely unpopular tax and it is not believed that this will be acceptable to either congress or the administration. Senator Smoot, a member of the senate finance committee, has estimated that $1,500,000,000 can be raised through a tax of 1 per cent on retail sales and that $3,000,000,000 could be raised by a 1 per cent tax on all sales and that $1,000,000,000 could be raised through a similar tax on transactions of all exchanges.

Senator Smoot says that while he has prepared a plan of sales taxes it will be useless to try to enact it as the President would veto it and that there could be no excuse of worrying the public by a consideration of such legislation when results are impossible. He claims that the republicans can do nothing in this way until they have an executive who will co-operate with them.

It is evident, therefore, that the excess profit taxes will remain in effect during the present administration. It is hoped, however, that administrative features of the revenue act might be simplified so that excess profit taxes might be collected without raising prices all along the line. While some of the more radical group are urging that higher income and inheritance taxes should be made to bear a large part of the burden of taxation, sentiment for such a program in congress is comparatively slight. Concerning the proposed sales tax, Senator Penrose, chairman of the finance committee, is not convinced that it would help to reduce prices. He will be in Washington within the next two weeks, it is said, and will discuss the question.

Representative Fordney, chairman of the house committee on ways and means, is in favor of the sales tax plan but his view does not represent that of the majority of the committee of which he is head. He is said to have taken this attitude largely in order that it will accord with his favoring a program to get increased revenue to provide bonuses for former soldiers.

So far as the producing and consuming interests of the country are concerned, evidence points to the fact that hope for early relief from taxation is futile. Taxes will be heavier if congress passes legislation giving bonuses to former soldiers.

Palmer Defines Regulation of Exports to Mexico

Washington, April 12.—Attorney General Palmer, in response to a request from the department of state, has rendered an opinion that exportation to Mexico of machinery for the manufacture of arms and ammunition can be stopped only by exercise of the war powers still vested in the President. The attorney general added that in his opinion the exportation of equipment for the erection of a munition making plant in Mexico would not in itself afford opportunity for disorder and violence. He said that while ultimate use of such machinery might result in disorders, within the present laws there was no ground for establishing an embargo.

Democrats to Oppose New Antidumping Bill

Washington, April 13.—Democrats in the senate have served notice that they will oppose the antidumping bill reported to that body last week by the committee on finance, through Senator Smoot, Republican, Utah, Senator Thomas, Democrat, Colorado, announced that he would file a minority report. In view of the attitude of the democrats, it seems unlikely that the bill can pass in its present form at this session of congress.

The measure reported by the committee strikes out everything after the enacting clause in the house bill which passed the lower branch of congress last December, and substitutes new clauses. These provide that whenever the purchase price of imported merchandise, dutiable or free, of a kind produced in the United States, shall be less than the actual market value there shall be levied, in addition to the duties, if any, a dumping duty in the amount of the difference between the purchase price and the actual market value, or between the purchase and the price for exportation to a country other than the United States, or between the purchase price and the cost production, as the case may be. It is provided, however, that the dumping duty shall not apply to any advance in the actual market value or the price for exportation, between the time of the purchase and the time of exportation. This dumping duty would be applied also if there is no actual market value whenever the purchase price is less than the price at the time of exportation to a country

other than the United States; or in case there is neither actual market value or price for exportation; or in case the value or price cannot be ascertained to the satisfaction of the appraising officer.

Alexander Censors Trade Plan Lansing Urged

Washington, April 13.—The proposal of Robert Lansing, former secretary of state, that a reorganization of the state department should involve the absorption of the trade functions of the department of commerce has been declared by Secretary of Commerce J. W. Alexander to be contrary to the sentiment of business interests and unsupported by sound argument.

The secretary of commerce expressed keen regret that Mr. Lansing, while serving as secretary of state, "saw fit to write to senators and representatives recommending the transfer of functions without frankly talking it over with me." Expressing his belief that this duplication between the two departments in the foreign trade field could be prevented by close cooperation. Secretary Alexander said the special advantages of having trade promotion work carried on by a business department should be preserved.

"I feel," he said, "that the strictly trade promotive work in foreign countries is today handled effectively by commercial attaches and trade commissioners of the bureau of foreign and domestic commerce, and I know of no sound arguments why these officials should be abolished in order that the work they are doing may be taken over by consuls and other officials of the department of state."

Would Make Rail Tariffs More Specific

Washington, April 13.—Common carriers should be required to show by appropriate symbol in each tariff the status of each of the carriers participating in the rates mentioned in the tariff, as to whether it is an originating, intermediate or delivering carrier. This is the recommendation made by Examiner Lawrence Satterfield in a tentative report to the interstate commerce commission in the case of Joseph L. Leberman Iron Co. vs. the Wabash railroad, and others.

The complaint, while asserting that a rate of $2.94 on iron and steel turnings from Detroit to Granite City, Ill., and St. Louis was unjust, involved only a tariff interpretation. The question was whether in tariffs issued by the Michigan Central, Grand Trunk and Detroit & Toledo Shore line, the Wabash was offering a rate of $2.10 on the scrap material mentioned.

The traffic manager of the complainant, consulted a Wabash tariff in Chicago and directed the shippers in Detroit to route by way of the Wabash at the $2.10 rate. They did not take the turnings to the Wabash as an originating carrier. It could have carried the traffic all the way over its own rails. They took the scrap to other carriers and the latter assessed the higher rate which the examiner said was the legal rate because the other carriers were not obligated to turn the traffic over to the Wabash as an originating carrier. They took it to the Wabash merely for delivery.

Mr. Satterfield examined the Wabash tariff and found it impossible for a shipper to determine from the concurrence marks, what the Wabash was offering to do for shippers.

Finds Western Rate on Rods Prejudicial

Washington, April 13.—In a tentative report to the interstate commerce commission, Examiner Richard T. Eddy has recommended that the commission find that rates on wire rods from points in transcontinental groups A, B, C and D to South San Francisco, Cal., are not unreasonable, but are unduly prejudicial to the extent that they exceed 90 per cent of the rates contemporaneously maintained by the defendant railroads, the Santa Fe and others, on galvanized wire, wire netting and wire rope from and to the same points. Among points covered in the groups mentioned are the Pittsburgh district and Harriet, N. Y. The complainant is E. H. Edwards. The examiner says that reparation should be denied.

Complaint was made against the rate of $1.25 per 100 pounds of wire rods over ¼-inch diameter, in carloads of 80,000 pounds or more, from Harriet, N. Y., and Woodlawn, Pa., and other points in group B to South San Francisco, where the complainant is engaged in the manufacture and sale of wire, wire rope and wire netting. He asked for the establishment of a rate of $1.

The defendants, the examiner stated, are not warranted in charging at this time from eastern points as high a rate on wire rods as is contemporaneously applied on wire rope and wire screen.

"Such an adjustment," he said, "undoubtedly subjects wire rods to an undue prejudice and is unduly preferential of wire rope and wire screen, and this prejudice the commission should by order require to be removed."

Shipping Board Asks Aid of Business Men

Washington, April 13.—President James A. Farrell, of the United States Steel Corp., and Sam P. Bush of the Buckeye Foundries Co., Columbus, O., are included in a list of 18 business men and government officials who have been invited by Admiral W. S. Benson, chairman of the shipping board, to attend a two days' conference beginning on Thursday of the present week. The board seeks their aid and advice as to proper policies regarding the building up of an American merchant marine and the disposition by the board of its $3,000,000,000 worth of ships and other property. The call issued by Admiral Benson in part follows:

"The United States shipping board has before it at the present time two large business problems, the solution of which vitally effects the future of the merchant marine of this country. One is the method, price and terms of the sales of its ships to private owners, and the other is the operation of its fleet, pending the sale and disposition thereof.

"The board desires to bring to its aid the best merchandising experience and ability that can be found in this country. The great producing forces of the country from factory and farm are those most vitally effected by the policies established by the shipping board. Unless our national surplus can be successfully disposed of abroad in competition with foreign countries, our American laborer, farmer and capital must of necessity be injured, and our national prosperity impaired.

"We know that you fully appreciate that the shipping board can only successfully solve its problems if men of your broad merchandising ability and patriotism will give us aid."

Offers Jobs to Trained Military Men

Washington, April 6.—The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., through Vice President H. P. Davis, has advised the office of the chief signal officer, eastern department headquarters, war department, that signal corps men who during their enlistment complete the course of Camp Alfred Vail with the character grading of "excellent," will be given special attention upon their discharge from the service if they apply for work with that company. Mr. Davis made the announcement in a letter addressed to Col. E. Russel, signal officer in New York, in reply to a communication dealing with the subject of vocational training.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

A H. WOODWARD, Birmingham, Ala., was elected chairman of the board of directors of the La Belle Iron Works, Steubenville, O., held in that city, April 6. This meeting was a postponed session of the board which was to have been held in March. Mr. Woodward succeeds George Greer, of New Castle, Pa., who has held that position for many years and who now resigns because of ill health. Mr. Greer's letter of resignation was accepted with regret and a vote of thanks was voted to him for his services.

Officers re-elected at this meeting are as follows: R. C. Kirk, president; H. D. Westfall, vice president and general sales manager; D. A. Burt, vice president and treasurer; G. B. Levan, general manager; W. B. Higgins, secretary and assistant general sales manager; H. P. Beswick, assistant treasurer and credit manager; W. T. Burt, assistant secretary and auditor; J. L. Fisher, assistant auditor.

Mr. Woodward has the distinction of being a grandson of the founder of the La Belle plant in Steubenville in 1852. For a long period he was one of the principal stockholders and officials of the company, which has grown into one of the largest industries of the kind in the Ohio valley. In the fall of 1918, Mr. Woodward was elected chairman of the board of directors of the Woodward Iron Co., Birmingham, in which he has been interested for many years.

L. Pfeiff has been promoted from the position of freight agent to traffic manager of the United States Steel Products Co., New York.

Alfred C. Schauer has been appointed Cleveland district manager for the Lloyd-Thomas Co., Chicago, appraiser-engineer, with headquarters at suite 819 Hippodrome building.

Albert Meahen has resigned as secretary of the Farrell, Pa., chamber of commerce to become welfare director of the Donora, Pa., plant of the American Steel & Wire Co.

Ralph E. Carpenter now is with the Hollister-White Co., Boston, having severed his connection as manager of the lynite laboratories of the Aluminum Manufactures, Inc., Cleveland.

Gilbert L. Robinson and Charles E. Masters sailed from Vancouver on April 10 for Shanghai where they will open an office for the Consolidated Steel Corp., New York.

J. F. Geary now is assistant superintendent of the Chicago plant of the American Brake Shoe & Foundry Co. He formerly was superintendent of the Thatcher Furnace Co., Garwood, N. J.

Thomas Bradshaw, finance commissioner of Toronto, has resigned his position to become treasurer and a director of the Massey-Harris Co., Toronto, manufacturer of agricultural implements.

Charles R. Sturtevant, for several years education director of the American Steel & Wire Co., with headquarters in Worcester, Mass., has been transferred to Cleveland, which will be the future headquarters of this department.

C. H. Newcomb, member of Crocker Bros., and resident manager at Philadelphia for that company, has returned to his office in the Pennsylvania building, Philadelphia, from Pinehurst, N. C., where he spent some weeks in recuperating from a long illness.

E. F. Axner, for many years in charge of pig iron sales for the Illinois Steel Co., at Chicago, who recently resigned that position, has become treasurer of the Aetna Ballbearing Mfg. Co., 213 Institute place, Chicago.

George M. Wright, former president and general manager of the Wright Wire Co., Worcester, Mass., now part of the Wickwire-Spencer Steel Corp., will leave May 1 for Calgary, Alberta, where he will spend the summer on the ranch of his children.

Robert K. Morton will resign as general manager of George W. Prentiss & Co., Holyoke, Mass., on May 1 to become treasurer of the Holyoke Covered Wire Co. He has sold his interest in the former company to W A. Prentiss, purchasing the latter's holdings in the Covered Wire Co.

Harry E. Richards, of the St. Louis office of the United States Cast Iron Pipe & Foundry Co., has been transferred to the Chicago office to succeed John D. Capron in the sales department, the latter having become publicity manager at the Burlington, N. J., office.

G. W. Smead has resigned as master mechanic at the Berger Mfg. Co., Canton, O., to become superintendent of the new Louisville Sheet Steel Co.'s plant being erected at Louisville, Ky. Upon his resignation, Mr. Smead was presented with a gold watch by employes of the Berger company, in commemoration of their esteem.

R. C. Garlick, Cleveland district sales manager for the Sharon Steel Hoop Co., Sharon, Pa., for the past year, has resigned to become affiliated with the Columbia Steel Co., Elyria, O., as assistant to its vice president and manager, C. E. Lozier. Mr. Garlick will have charge of sales in his new connection. Prior to taking charge of the Sharon Steel Hoop Co.'s Cleveland office, he had spent 11 years at its Sharon and Chicago offices.

Judge E. H. Gary, chairman of the United States Steel Corp., has been presented with the cross of grand officer of the crown of Italy, according to an announcement by F. Cuattrone, acting Italian high commissioner in appreciation of his war work. He also announced that the cross of knight commander of the crown of Italy had been presented to James A. Farrell, president of the Steel corporation; William H. Woodin, president of the American Car & Foundry Co., and Andrew Fletcher, president of the American Locomotive Co. The cross of officer of the crown of Italy was conferred at the same time upon Charles S. Gawthrop, vice president of the American Car & Foundry Co.; E. P. Thomas, president of the United States Steel Products Co.; F. Wilshire, vice president of the Consolidation Coal Co., and Charles Muchnic, vice president of the American Locomotive Co.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

G. E. STOLTZ, general engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed engineer in charge of the steel mill section of the engineering department. After graduating from the electrical engineering course of Ohio State university in 1909, Mr. Stoltz entered the apprenticeship course of the Westinghouse company after which he became engaged in steel mill work. W. E. Thau, another general engineer of the Westinghouse company, has been appointed engineer in charge of marine section of the engineering department. Mr. Thau was graduated from the University of Cincinnati in 1911 and entered in the apprenticeship course of the Westinghouse company. Later he became engaged in steel mill and marine work. He has been in marine engineering work since this company became actively associated with the development of electrical equipment for this type of service.

L. A. S. Wood has been made manager of the illuminating section of the supply department of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., with headquarters at South Bend, Ind. Mr. Wood has been closely identified with the lighting industry ever since he began his business career and is thoroughly familiar with lighting practice not only in this country but in England. He was born in London and received his higher education at the University of London, later studying electrical engineering at Finsbury Technical college. He was connected with the Edison & Swan United Electric Light Co. in the early days of the incandescent lamp. Mr. Wood came to the United States in 1911 to introduce the flame carbon arc lamp and was shortly afterwards appointed as arc lamp expert of the Westinghouse company at East Pittsburgh. After the introduction of the mazda C type lamp he became associated with the George Cutter Co., South Bend, as illuminating engineer. For the past nine years he has traveled extensively taking an active interest in street lighting improvements in all parts of the country.

G. J. Hawkey, president of the Cleveland-Duplex Machinery Co., 1224 West Sixth street, Cleveland, has gone to Cambridge Springs, Pa. for about two weeks.

Otto A. Yingling, formerly with the Washington Steel & Ordnance Co., now is connected with the Ward Tool & Forging Co., Latrobe, Pa., as general superintendent.

A. F. Orcutt, who has been vice president and general manager of the Rivett Lathe & Grinder Co., Brighton, Boston, recently was elected president and general manager.

Rudolph H. Fox now is eastern representative, with headquarters at Hartford, Conn., for the Gurney Ball Bearing Co., Jamestown, N. Y. He formerly was Detroit district manager.

M. P. Heinze, formerly superintendent of the Union Special Machine Co., Chicago, has become works manager of the Krebs Mfg. Co., that city, maker of jibs, fixtures, tools, etc.

Jean Seybold, who for three years has been department superintendent at the Watervliet, N. Y., arsenal, returned recently to the Hamilton, O., plant of the Niles Tools Works, as production manager.

R. E. Hogrebe resigned recently as crane manager for the Chesapeake Iron Works, Baltimore, after three years' service, to enter business for himself as the Control Mfg. Co., Catonsville, Md.

Robert C. Witte, president of the R. C. Witte Mfg. Co., Hockanum, Conn., near Hartford, Conn., has bought the Adams Tool & Mfg. Co. plant in Hockanum, to operate in connection with his manufacturing business.

Charles J. Manuel now is mechanical engineer with the S. W. Card Mfg. Co., Mansfield, Mass., maker of dies, reamers, taps, etc., having resigned his connection with the American Steam Gauge & Valve Co., Boston.

Frederick J. Wuest resigned recently as general superintendent of the George H. Bishop Saw & Edge Tool Mfg. Co., Lawrenceburg, Ind., at the age of 73, because of failing health. His service with the company extended over half a century, during which time he invented many of the saws and tools made by the company and some of the machinery used by it. W. H. Tuthill, of Columbus, O., succeeds him.

Edward C. Gaines, formerly engineer in the crane and conveying machinery department of the Dominion Bridge Co., Montreal, Que., has become affiliated with the engineering department of the Mead-Morrison Mfg. Co., Chicago.

A. C. Johnston, formerly chief engineer of the Chicago works of the Link-Belt Co., has been elected a vice president and resident general manager of the Chicago works. He succeeded Prentiss L. Cooley, who resigned to devote his time to the presidency of the Isko Mfg. Co.

Howard E. Tracy now is chief of the engineering department of the O. S. Walker Co., Worcester, Mass., manufacturer of grinding machines, magnetic chucks, etc. He formerly had charge of grinding machine development for the Baxter D. Whitney Co., Winchendon, Mass.

Augustus Wood now is advisory engineer in the machine tool plant at Fitchburg, Mass., of the Manning, Maxwell & Moore Co. Inc., New York. He formerly was works manager of the Niles Tool Works, Hamilton, O., but retired on April 1 after 28 years of continuous service.

Henry H. Skinner has been elected president and director of the Hendee Mfg. Co., Springfield, Mass., to succeed John F. Alvord, resigned. F. J. Wechsler has been promoted from treasurer to vice president in charge of sales, financing and auditing and Lieut. Col. Lindley D. Hubbell has been made vice president in charge of operations and director.

George H. Fristoe, who has been associated with the sales organization of the Stocker-Remely-Wachs Co., machine tool dealer, Chicago, for the past eight years, has been appointed sales manager, and will have charge of all selling activities. Mr. Fristoe has been in the machine tool business in Chicago territory for more than 16 years, his long experience fitting him for this promotion.

Ratio Curves Show Fluctuations

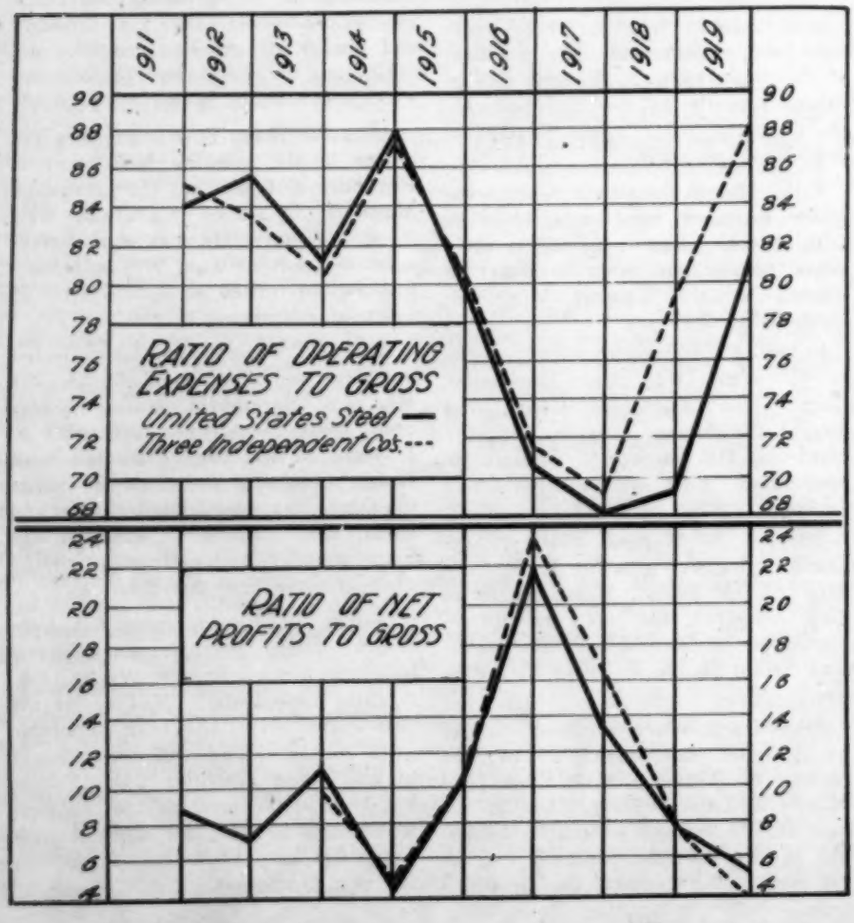
Study of Reports of Important Steel Companies Reveals Interesting Ups and Downs of Operating Expenses and Net Profits Percentages of Gross Sales—Strikes Forecast Higher Prices—Other Financial News.

BY JOHN W. HILL, FINANCIAL EDITOR

VIOLENT and striking fluctuations which have taken place in the curves of operating expenses and net earnings in the iron and steel industry during the last few years accurately picture the ups and downs that have marked the recent history of the trade. A study of the annual reports of the United States Steel Corp. and a number of leading independent companies over a series of years discloses that after spectacular careers during the war period the average ratio of operating expenses to gross sales and the ratio of net profits to gross, at the close of 1919, stood at a somewhat less favorable level than in normal prewar years.

In the three-year period covering 1911 to 1913 the ratio of operating expenses to gross sales of the United States Steel Corp. averaged 83 per cent. It was low in 1913 when the market was active, and prices were rising and it rose to as high as 88 per cent in 1914 when depression in the trade appeared and the European war broke. Singularly enough the average ratio for the three independent companies, the Republic Iron & Steel Co., the Lackawanna Steel Co. and the American Steel Foundries correspond closely with that for the corporation. This was at a low point in 1913 and saw a swift rise in 1914 to 87.8 per cent.

The 1914 showing was the adverse peak, however, for the decline commenced in 1915 as the stimulation of war business began to be reflected in steel company earnings. The average for the corporation during that year stood at 79.9 per cent, while that for the independents had a similar drop to 80.3 per cent. For 1916, 1917 and 1918 the operating expense ratio for the corporation exhibits the remarkably low average of 66.5 per cent, while that for the independents was higher at 73 per cent. Diversification is shown in the results of the three companies however, in 1918. The operating expense ratio of Republic was 75.9 per cent; for Lackawanna it was low at 69.7 per cent and for the American Steel Foundries it was high at 91.82 per cent.



Tide Turns in 1919

The tide turned definitely in 1919 reflecting the uncertainties and curtailed production in the industry. The better operating position of the corporation than most of the independents during last year is revealed in the fact that while the ratio of operating expenses to gross sales was 81 per cent for the large organization it had risen to 88 per cent for the others.

The record of expense curve has its counterpart in the ratio of the net profits to gross sales. The four-year average in the period from 1911 to 1913 for the corporation was 10 per cent which shrunk to 4 per cent in 1914. The rise began the next year and attained its greatest height in 1916 at 22 per cent. A gradual decline took place in 1917 continuing until 1919 when the low point of 5.2 per cent was reached. The three companies used in the compilation of the ratio of net profits to gross sales curve were the Lackawanna, the Republic and the Bethlehem Steel Corp. The independent company curve begins in 1913 when the average for the three interests was 10 per cent; it dropped in 1914 in company with the Steel corporation curve to 4.9 per cent and started to advance in 1915 reaching the peak of 23.5 in 1916. The company to achieve the highest record in the net profits ratio in the war period was Republic with 27.9 per cent. The independents ratio slumped to 3.7 per cent in 1919 with Bethlehem high in that year at 5.4 per cent, Republic next with 4.7 per cent and Lackawanna low with a profits ratio of only 1 per cent.

Strike Overhangs Situation

Recent developments in the financial world have been overshadowed by the railroad strike, which has brought a threat of checking the favorable progress that was being made in pro-

duction and deliveries. The curtailing of production in the great basic industries would be a serious blow at the healthful price stabilizating tendencies as a result of what appeared to be an abatement in the acute demand. Many had believed that labor had learned its lesson of the futility of strikes impressed by the experiences of last year in the coal, steel, Boston police strikes, and other outcroppings of unrest. The railroad trouble, however, indicates that labor is still lending its ear to the seductive voice of the radical agitator. The outcome of the present manifestation should establish definitely whether the old conservative leaders of labor are to maintain their influence and control. A repetition of the irresponsible strike fever seen last year only will mean further postponement of the return to normal conditions and fresh increases in the cost of living.

The condition of the investment market was vividly indicated last week by the necessity of Pennsylvania railroad to offer a 7 per cent return on its mortgage bond issue, which return together with the flotation expenses means almost 8½ per cent as the cost of the money to the road. At the high rate, the bonds sold quickly and this financing is to be followed by that of other roads, all of which will react favorably upon the iron and steel markets where much of the money will be spent for equipment. A slight increase in the federal cash reserve ratio last week showed somewhat easier money conditions, due in part to loan contraction, but largely to the April dividend distributions. Permanently improved credit conditions are not expected by bankers. Nearly $50,000,000 of gold has arrived from England, but plans for exportation of metal to South America will prevent the accumulation of a sufficiently large surplus to permit of much further credit expansion, it is believed.

Large Earnings in Steel Shown in February

That current market activity in the iron and steel industry is being reflected in the earnings of individual companies is indicated by the consolidated statement of earnings of the Steel & Tube Co. of America for February which shows as follows:

Sales, $6,332,868; cost of sales, $5,296,786; gross operating profits, $1,036,082; miscellaneous income, $23,198; total income, $1,059,280; miscellaneous charges and reserve for federal income tax, $113,140; **gross earnings, $946,141**; interest on funded and other indebtedness, $134,792; net earnings, $811,349; month's proportion of preferred stock dividend, $102,083; net earnings available for depreciation and common stock dividends, $709,265.

Enameling Shows Gain

The National Enameling & Stamping Co., St. Louis, reports for 1919 a surplus, after charges and federal taxes, of $3,807,073 compared with $2,773,265 in 1918. There was a charge for depreciation of $935,914 which was an increase over the $927,079 in the previous year. Federal taxes were smaller with only $800,000 charged off for that purpose against $1,100,000 in 1918. The comparative income account follows:

	1919	1918
Gross profits	$ 5,636,857	$4,957,601
Other income	177,753	115,049
Total income	5,814,610	5,072,650
Depreciation, etc.	935,914	927,079
Net profits	4,878,696	4,145,571
Bond interest	102,623	110,806
Federal taxes	800,000	1,100,000
Sinking fund	169,000	161,500
Balance	3,807,073	2,773,265
Preferred div.	649,131	598,263
Surplus	3,157,942	2,175,002
Previous surplus	7,158,523	5,919,029
Total surplus	10,316,465	8,094,031
Common dividend	935,508	935,508
Federal taxes	*1,150,353	.....
Surplus	8,230,604	7,158,523

*Deduct additional federal taxes for 1918.

Common Stock Increased

Otis Elevator Co. earnings in 1919 exceeded those for any previous year in the company's history, the annual report discloses. The surplus for the year amounted to $1,931,625 as compared with $1,012,488 in 1918. Federal taxes for the year were $750,000. The report calls special attention to the improved financial position of the company reflected in the reduction of bank loans and payment and conversion into common stock of $3,000,000 of outstanding debentures maturing April 1, 1920. The directors have recommended an increase in the common stock of $5,000,000 to $15,000,000. The stockholders will vote on this question at the annual meeting, April 19. Orders placed with the company during the last six months of 1919 and during the first few months of 1920 will tax the manufacturing facilities of the company to full capacity, the report says. The directors have authorized an increase in the dividend rate upon common stock to 8 per cent.

Case Sales Gain

The J. I. Case Threshing Machine Co. reports gross sales for 1919 of $32,342,653 compared with $25,162,769 in 1918. The net income was $2,909,482 against $2,353,236 the preceding year. From its 1919 earnings the company deducted $1,251,968 for loss on its European holdings. In 1918 a charge of $807,076 was made for this purpose, in addition to deductions for amortization of plant expenditures and inventory values totaling $628,539.

The balance sheet shows current assets totaling $24,534,828, against current liabilities of $2,990,663. Out of the 1919 earnings the company paid a 7 per cent dividend on its common stock in Liberty bonds.

Head of Railway Spring Sees Good Business

In order to promote its interests in Canada the Railway Steel Spring Co., has established a plant at Montreal where operations were commenced last January, the company being known as the Canadian Steel Tire & Wheel Co, Ltd., capitalized at $1,000,000, according to the company's annual report. Although business for the company was hesitant in 1919, expectation of large orders for locomotives and cars in which the company will participate, leads President F. F. Fitzpatrick to view the 1920 outlook hopefully.

The company in 1919 earned $16.16 a share on the common stock compared with $18.37 per share the preceding year.

	1919	1918
Gross earnings	.....	$25,182,031
Expenses, dep.. etc.	.....	17,163,012
Net earnings	*$4,394,353	$8,019,019
Interest	.....	92,920
Reserves	.....	.....
Federal taxes	1,200,000	4,500,000
Balance	$ 3,194,353	$3,426,099
Preferred dividends	945,000	945,000
Common dividends	1,080,000	776,250
Surplus	$ 1,169,353	$1,704,849
Previous surplus	10,362,651	8,657,801
Total surplus	$11,532,004	$10,362,650

*After deducting manufacturing, operating, maintenance, repairs, administrative expenses, depreciation, etc.

At annual meeting directors were elected and A. S. Henry, vice president, added to board, making 12 directors. At organization meeting, officers were re-elected.

Stockholders of the Dayton Malleable Iron Co., Dayton, O., have voted to double the capital stock to $2,000,000. Of that amount, $600,000 will be in 7 per cent preferred. This increase is for the purpose of adding to facilities and equipment and to develop the new plant established in taking over part of the Platt Iron Works, that city.

Labor Troubles Hurt Tool Sales

Shipments from Builders to Dealers and from Latter to Users Hindered by Tieup—Demand Continues Brisk Especially from Manufacturers Who Require One or Two Tools—Crane Market Is Dull.

LABOR difficulties, directly and indirectly again are acting as a brake upon the supplying of the present machine tool demand. All districts are more or less affected by the railroad situation, brought about by striking yardmen. This hinders both inbound and outbound shipments. New York also is experiencing a harbor strike and many market centers have their attention centered in Cincinnati where machine tool builders are expected to stand out against demands of workmen slated for presentation May 1. These manufacturers are asking users to take any equipment that will serve their needs, since they are unable to foretell when they will be able to fill orders according to specifications. Delayed shipments are of course enlarging the market for used and rebuilt equipment, both in the United States and Canada.

Demands are numerous in practically all selling centers for one or two tools. This represents a veritable flood in Cleveland. Practically no large lists are current, although a few inquiries are out asking for four, five, six or more units. The Lehigh Valley railroad was expected to close early this week on a large list. Recent purchasers of sizable lots of equipment include the Merchant Shipbuilding Co., International Motor Co., Nathan Mfg. Co., Edison Lamp Works, Elyria Enameled Products Co., Scott-Spencer Automatic Tool Co., and many other companies took machines from floors. Five machines are on a list issued by the Timken-Detroit Axle Co., and lists are expected soon from the Wright Aeronautical Corp., Schwartz Motor Truck Corp., Electric Storage Battery Co. and the Oxweld Acetylene Co Chicago reports a large demand from washing machine makers.

What is characterized a lull is noted in the crane market. Those who want such equipment appear reluctant to close, although numerous awards of one crane each of the various types are reported as having been made recently. The West Virginia Metal Products Co., bought three, the Lycoming Foundry & Machine Co. purchased four, and the Boston Elevated Railways awarded six hoists. The United States Steel Corp. is understood to be holding up numerous contracts for cranes for prospective plant extensions and the Pittbsurgh Plate Glass Co. has not placed its order for four for Kokomo, Ind. Outside of a few inquiries reported for one crane each, Sotter Bros., Inc., wants three of the electric type.

Machine Tool and Crane Sellers Experience Lull

NEW YORK, April 12.—While there is a good miscellaneous demand for machine tools, sellers of machine tools in the East assert that buying has been relatively dull during the past week. They believe the biggest factor in this development is the deferred deliveries offered on practically all lines of equipment. These vary from one to five months and where motors are involved, deliveries often are still further delayed. It would appear, however, that in some instances deliveries have slightly improved, and largely responsible for this relative steadiness is the heavy volume of buying of used machinery. The turnover in the used machinery market during the past few weeks has been the largest in many months. Retarding factors at the moment upon deliveries are the harbor strike in this city and the railroad tieup. The rail strike also is a factor in slowing up business at this time, since machine tool salesmen in many instances, are having great difficulty in covering their territory. This situation, of course, is believed to be but temporary.

Buying of new machines, while substantial, has not been featured by especially large orders. Among buyers of equipment at this time are the Merchant Shipbuilding Co., Chester, Pa.; the International Motor Co., Allentown, Pa., which closed on some fabricating equipment; and the Nathan Mfg. Co., New York City. This latter company is increasing its output of injectors, and also is to take up the production of valves and, it is understood, phonograph motors. The Edison Lamp Works has about completed the purchase of a substantial list of miscellaneous machinery for its Waverly shops in New Jersey. The Lehigh Valley railroad is expected to close today on a good-sized list of equipment. Actual buying by the railroads is dull at the moment.

The Wright Aeronautical Corp. has abandoned its plan for erecting a plant in Newark, N. J., having just sold its site, and has purchased an industrial building in Paterson, N. J., where it will engage in the production of airplane motors. It is understood used machinery will be purchased. A prospective buyer in the automotive industry is the Schwartz Motor Truck Corp., Reading, Pa., which recently purchased a 5-acre site in that city for the erection of a $500,000 plant. The Electric Storage Battery Co., Philadelphia, has just awarded a contract to William Steele & Sons Co., of that city, for the erection of a large plant and the Oxweld Acetylene Co., Newark, N. J., contemplates doubling the capacity of its plant, each thus requiring considerable new equipment. The latter company at present is buying a few miscellaneous machines. The $3,000,000 drydock project for Camden, N. J., has been temporarily placed in abeyance, pending the formation of an operating

"Neva-Stain"

Non-Corrosive Steel

High silicon, chromium steel. Completely resistant to fruit and acids.

Especially adaptable for exposed surfaces which have to withstand the combined action of salt water and the atmosphere, also for cutlery and surgical instruments. When hardened it is file hard. Does not warp, crack or check.

"Delhi"

Rustless Steel

A high silicon chromium alloy steel, intended to be used in the soft condition. Is more rust resisting than any other metal yet produced. Can be forged with ease, and when annealed can be easily machined.

Highly resistant to acids and high pressure steam. Will not corrode or erode.

"Silcrome"

Heat Resisting Steel

Can be heated for months up to 1800° F without any appreciable scale forming on surface.

Very resistant to the action of acids, organic or inorganic.

Particularly adaptable for resistance wire elements, carburizing boxes, automobile valves, etc.

"Sicro"

Heat Resistant Alloy

Non-erodable, non-corrodable and non-oxidizable. Can be heated at 2000° F for months without any material scale forming. Particularly adapted for electrical resistance elements. Can be readily hot rolled, cold drawn and machined.

Four New Ludlum Steels

After extensive investigations we have finally produced a ***silicon chromium alloy steel*** which has resulted in a more non-corrosive metal than any previous records have ever shown.

This new patented alloy can be forged and rolled with ease, hardened without difficulty and annealed so that it will machine easily. It is capable of taking a very high mirror finish, and is highly resistant to the action of nitric, sulphuric, hydrochloric, acetic and fruit acids, and also to atmospheric and salt water corrosion.

This remarkable alloy combination is also extremely durable at high temperature, and has a very high specific resistance.

We are now using this new alloy in the formulae of four new Ludlum Steels described in the panel at the left.

Prompt shipments from warehouse stock at Watervliet, N. Y.; Detroit, Mich.; Chicago, Ill.; or Cambridge, Mass., handled through our Branch Offices.

LUDLUM STEEL COMPANY

General Offices and Works:

WATERVLIET, N. Y.

Branch Offices:

Chicago Cambridge, Mass. Detroit Buffalo New York City
Cincinnati Cleveland Philadelphia Pittsburgh

ESTABLISHED LUDLUM 1854

company. Frazer, Brace & Co., New York City, are to erect and equip the plant.

A lull prevails in the eastern crane market, with relatively few orders and new inquiries. Included in contracts is a double cantilever gantry crane for the Spicer Mfg. Co., South Plainfield, N. J., the order being placed with the Champion Engineering Co., Kenton, O. The original inquiry called for a 7½-ton crane. Another order is that of the Brighton Mills, Passaic, N. J., involving a 30-ton electric crane, placed with the Northern Engineering Works, Detroit. The Utah Copper Co., awarded a 30-ton handpower crane to the Erie Steel Construction Co., Erie, Pa. Riera, Toro, Von Twistern, Beaver street, New York, placed a 15-ton overhead crane for export to Cuba with the Champion Engineering Co., Kenton, O. The H. W. Johns-Manville, Manville, N. J., has purchased a 15-ton handpower crane. The West Virginia Metal Products Co., 14 Wall street, New York City, has placed orders for one 10-ton electric crane and two 5-ton cranes, for a new plant in West Virginia. The former crane was placed with the Shaw

Included in recent orders of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., are three 2-ton and one 1-ton crane, for the Lycoming Foundry & Machine Co., Williamsport, Pa., and six 2-ton hoists for the Boston Elevated Railways. Last week the company also was awarded eight 2-ton hoists by concerns along the Pacific coast.

New inquiries call for a 15-ton electric crane, with 55-foot span, for the Brooklyn Rapid Transit Co., Thirty-ninth street station; and a one 2-ton handpower crane with 40-foot span, for the Westinghouse Electric & Mfg. Co., Chester, Pa. The New York Edison Co., 32 Union square, is expected in the market shortly for an electric crane for a power plant in the Bronx. The March and Exporting & Importing Co., 220 West Forty-second street, is asking bids on a scoop conveyor. Sotter Bros., Inc., Pottstown, Pa., will close bids shortly on a 25-ton electric crane with 55-foot span, and two 10-ton electric cranes with 35-foot span. The Traylor Engineering Co., Allentown, Pa., also is expected to close soon on an electric crane, one of 30 tons capacity, for installation in western Canada. The Lutz Co., Philadelphia, in the market for a 10-ton electric crane with 40-foot span, is expected to close this week. The Florida East Coast Railway Co., 120 Broadway, is inquiring for a 110-ton wrecking crane, and Critshfield & Co., Chicago, wants a 50 to 60-ton crane.

The board of governors of the Material Handling Machinery Manufacturer's association has appointed a committee with H. W. Gledhill, of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., chairman, to co-operate when possible with city officials of Baltimore, in carrying out their program for making $50,000,000 harbor improvements. The crane committee of this association recently met and drew up specifications for 30 half-gantry traveling wharf cranes for a new terminal to be erected on Staten Island by the city of New York, for operation by the Pan-American Dock and Terminal Corp., 233 Broadway, New York City. These specifications are to be presented for the approval of the officials of both the Pan-American company and the city of New York.

Crane Buyers Reluctant to Close

PITTSBURGH, April 13.—Little of interest lately has developed in the machinery and equipment market here. While a number of crane inquiries appear close to the awarding stage, buyers for some reason, appear slow to place the orders. Some really big purchases of cranes and other equipment, in connection with plant extensions, are known to be under contemplation by various subsidiaries of the United States Steel Corp. Appropriations have been figured out and submitted to New York, but so far no action has been taken by the officials of the company. It is stated that the reason for the delay is that the finance board has sought assurance that the new installations would result in a saving in operating expenses of 5 per cent the first month, but on account of the labor situation, plant superintendents have been unable to give this assurance. The Pittsburgh Plate Glass Co. still is to close on four cranes for its Kokomo, Ind., plant and several other inquiries recently referred to also are pending.

Demand for machinery and tools continues fairly brisk, although sales run largely to single pieces rather than complete lines.

Labor Troubles Interfere With Machinery Purchases

CHICAGO, April 13.—Two factors in the machine tool market here now are assuming great importance. One is the present strike of railway yardmen, interfering with inbound and outbound shipments, which has given the market an appearance of dullness. The other factor is the expected strike at Cincinnati which is scheduled for May 1 when manufacturers there except to fight labor demands, which may interrupt production for some time. In preparation for this contingency, Cincinnati builders are urging sellers everywhere to take whatever machines are now ready for delivery, even though they may not be exactly the types usually called for by their trade.

Chicago merchants find their total of March sales was high, although not a record breaker and that more shipments were made than new sales, back orders having come through better than formerly. At present considerable demand for tools is coming from manufacturers of domestic appliances, such as washing and ironing machines, and an Illinois buyer who has taken an order for 10,000 mangles has just bought equipment such as milling, drilling and tapping machines to start turning out this order, with the probability that further machines will be needed shortly. Manufacturers of washing machinery and kindred lines have been buying heavily of punch presses and builders of the latter class of equipment find it impossible to keep up with demand. Prices of punch presses, already high, have been advanced 15 per cent recently. Gear cutters have gone up

Numerous Small Inquiries Reach Dealers

CLEVELAND, April 13.—Veritable floods of inquiries are pouring upon dealers in this district but these mostly are for one or two machine tools. Orders are in proportion since many sales continue to be made from warehouse or display room floors both to local and out of town users. Used machinery is being quoted upon freely because of the deferred deliveries on new tools. This class of equipment finds many takers. The poor delivery situation is becoming more and more accentuated because of the transportation difficulty. Several railroads will not accept shipments into Cleveland and one of the express companies has over 500 cars to unload. It is stated that the Big Four railroad has not brought anything into this city in the past 10 days, due to the congestion and latterly due to the strike of yardmen. This latest labor flareup in connection with the railroads is thought to be the cause of holding up expected machine tool lists. In this respect the situation

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In Lengthening A Bridge

Ten rivet heads were burned off in half as many minutes by the Airco Process. The illustration shows the operator removing the rivets in a flange angle to permit connection of an extension to the main structure.

This is but one example of the advantages of oxyacetylene cutting and welding in the metal industries. There are hundreds of others. The greatest advantages are obtained where users are assured of good gas service.

Airco Oxygen and Acetylene Service is Good Service.

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OXYGEN
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ACETYLENE GENERATORS
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AIR REDUCTION COMPANY, INC
NEW YORK

AIRCO SERVICE—A DISTRIBUTING STATION NEAR EVERY AIRCO USER

remains unchanged from a week ago, the Nickel Plate railroad's list being the only one worked at present.

One exception to the rule of manufacturers asking for one or two tools is the Timken-Detroit Axle Co., Canton, O. It has issued a small list calling for one each 24-inch shaper; 24-inch x 10-foot lathe; large drill press; swaging machine and No. 6 arbor press. The James R Gloyd Co., 1816 East Thirty-third street, Cleveland, is in the market for a punch press to punch 7/8-inch holes through ½-inch stock; one cutting off shear, 4 x 4-inch angles; one Yoke riveter; and one 6 x 6-inch or 8 x 8-inch air compressor. The L. C. Graves Co., Springboro, Pa., wants one 1-inch feed glue jointer; one 12-foot glue clamp machine; one complete 125 to 175 kilowatt, 220-volt, 3-phase Skinner steam power plant. The Thermo-Electric Co., 406 Grant building, Los Angeles, is in the market for drills, lathes, motors and other equipment for the manufacture of electrical appliances. Presses, bending machines, etc., to manufacture sheet metal products are to be purchased soon by the John H. Isert Co., Louisville, Ky., and by the H. Schriber Sheet Metal Co., Dayton, O. Presses and other equipment are to be bought from time to time by the Bucyrus Copper Kettle Works, Bucyrus, O., which will build a plant. The Dayton Toy & Speciality Co., Dayton, O., wants a No. 13 Toledo horning press with 6-inch stroke and a power shear, 42 or 46-inch wide for 14 gage or lighter material. The Bovaird Co., Bradford, Pa., is in the market for a 4½-foot Bickford radial drill with single pulley drive through quick-change speed gear box. The Leader Iron Works, Chicago and Decatur, Ill., wants a 5-foot radial drill with tapping attachment, motor or belt drive. The Satety Nut & Bolt Co., Cleveland, is in the market for milling machines, while the Grant Motor Car Co., that city, wants a 14-inch drill press and a similar machine is wanted by the Electric Materials Co., North East, Pa. The B. F. Goodrich Co., Akron, O., wants among other equipment, one large horizontal boring, drilling and milling machine. The American Chain Co., Bridgeport, Conn., wants a 100 or 200-ton press.

Among recent sales in Cleveland is a No. 208-A Niagara flanging machine to the Cleveland Wire Spring Co., that city; one lathe to the Hydraulic Steelcraft Co., also of Cleveland, and a 42-inch vertical boring and turning mill with two swivel heads, to the King Machine Tool Co., Cleveland. Much of the equipment needed by the Elyria Enameled Products Co., Elyria, O., has been purchased. However, it recently tripled its capital to $1,500,000 in order to build and equip a new machine shop, buy new sand blast equipment and equip a ceramic and physical laboratory. The orders of the Columbia Machine Tool Co., Hamilton, O., for equipment for its addition will be placed with its own selling agents. The Shannon Bed Spring Co., 638 East Main street, Louisville, Ky., has purchased machinery for the manufacture of steel spring but is to erect two new buildings and probably will require more machinery. The Cleveland Forge & Iron Co., Cleveland, also bought equipment recently. The Scott-Spencer Automatic Tool Co., Cincinnati, recently closed on universal grinders, milling machines, tool room lathes with relieving attachments but having increased its capital from $10,000 to $50,000, will made additional purchases of needed machine tool equipment in about one month. Hendey lathes are among the requirements of the Auto-Lite division of the Willys Corp., Toledo, O. Announcement is made that this company has purchased 55 acres in Fostoria, O. It will install ignition and auto parts plants immediately and add other units as soon as proper facilities are available for taking care of a large number of workmen. Equipment requirements are expected to be large.

Improvement in Exchange Helps Machinery Business

TORONTO, Ont., April 10.—Business in machine tools in Canada has become more settled as a result of improved conditions in the exchange situation. Dealers and users still are handicapped in getting delivery where equipment is wanted promptly and are taking much rebuilt equipment. A feature of the present machine and tool supply market is the increasing quantity of English made goods that many dealers and agents are offering. It is believed that many British houses are recognizing the advantage of stocking their lines here as consumers are reluctant to depend on delivery dates, even when dealers promise better conditions than exist on some lines from the United States.

The demand for various lines of equipment is brisk and a number of inquiries have been received this week for machinery, tools, power plant equipment, etc. J. D. Ruttan, Municipal Hall, engineer, will call for bids at an early date for construction of waterworks plant, equipment, etc., to cost $200,000. Verle A. McCarty, Stettler, Alta., is contemplating erection of a power plant and installing machinery this year at Bashaw, Alta. The Lignite Utilization Board of Canada, 2 Youville square, Montreal, Que., R. A. Ross, chairman, will receive bids until April 27, on conveying equipment, etc. The Draper Mfg. Co., Petrolea, Ont., will remodel and equip a factory here for the manufacture of brass valves, etc. The Regal Tire & Rubber Co., Sherbrooke, Que., Robert W. Hogg, secretary, will remodel its plant and install additional machinery. Richard Hart, Brantford, Ont., will erect a brass foundry at 22 Leonard street, and will require equipment.

Germany Makes Machine Tool Exports Prohibitive

ACCORDING to The London Times, the government department at Berlin which has charge of Germany's export trade, known as the central bureau for export permits, has made new conditions operative which are designed to curtail shipments overseas of machinery from that country.

No permits are being granted for the export of machine tools, etc., unless the basis prices which prevailed in January, 1920, are increased by 600 per cent. If, for instance, the export prices in January were seven times greater than the former peace-time quotations, the prices today are to be 42 times higher than before the war.

The central bureau has taken into consideration the question of rendering it possible for a still further price advance to be made in the event of the mark experiencing a fresh decline. The bureau therefore recommends machinery makers to include in their offers a reservation that if the quotation for the dollar in Germany stands higher than 80 marks on the day of the delivery of the machinery, the price for the machines is to be increased by 1 per cent for every mark above 80 marks. If, for instance, the quotation on July 1 should be 100 marks, an addition of 20 per cent would be made to the price in the offer.

At the same time, and in order to serve as guiding lines, export prices in weights (kilograms) are mentioned for various kinds of lathes, vertical boring and turning machines, multiple drilling machines, wheel lathes, etc.

[redacted] STEEL COMPANY
PURCHASING DEPARTMENT
CHICAGO, ILLINOIS

Order No. 7253
This number must appear on all invoices and dray tickets.

Dec. 10, 1919.

American Crucible Products Co.,
Elyria, Ohio.

PLEASE FURNISH THE FOLLOWING GOODS SUBJECT TO ALL CONDITIONS HEREON, AND SEND INVOICE IN DUPLICATE WITH BILL OF LADING, TO PURCHASING DEPARTMENT, [redacted] STEEL COMPANY.

Promet
5000 Lbs. - ~~Genuine Babbitt~~ Bearing Metal

"Nine Hundred Per Cent Better!"

The Purchasing Agent of this world-famous Steel Company asks us not to use his name in advertising, but in a letter to a prospect he gives the following reasons why he always says "PROMET":

"PROMET is giving us ten times the service of the tin base babbitt we used previously, and, due to its adoption, we expect to save more than $100,000 this year.

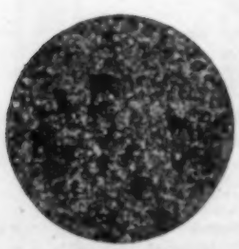
"The Superintendent informs me that PROMET tends to increase operating efficiency, as it is dependable, easily handled, and practically wasteless in use."

PROMET is uniformly giving from six to ten times the service of other metals in every kind of machinery. It also possesses unique properties which, in themselves, make PROMET indispensable to every user of bearing metals.

IT COSTS YOU NOTHING TO PROVE THE SUPERIORITY OF PROMET

If you are having bearing trouble write us fully. We like trouble.

If you think you are satisfied write for *"The PROMET Book"* and trial order forms. PROMET sets a new standard below which you cannot afford to be satisfied.



PROMET
Before Heat-Treatment

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THE HEAT-TREATED BEARING METAL

The American Crucible Products Company
Elyria, Ohio.

PROMET
After Heat-Treatment

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

POULTNEY, VT.—The plant of the Ruggles Machine Co. was recently damaged by fire.

BOSTON.—Hartel Brothers & Co., steel merchants, have purchased 25,000 feet of land in Cambridge, Mass., and will erect a warehouse.

BOSTON.—The P. & G. Tool Co. has been incorporated to make tools and machinery with $50,000 capital by F. Gordon Patterson, C. M. Price, Cambridge, Mass., and Charles E. Gale, Weymouth, Mass.

BOSTON.—The Colonial Foundry & Machine Works, Inc., has been incorporated with $20,000 capital, by William A. Snow, Thorton A. Snow, Somerville, Mass., and A. L. Ruggles.

BOSTON.—The Sani-Tite Cap Co. has been incorporated to make sealing devices with $100,000 capital by Elmer Beavers, Waltham, Mass.; Grant G. Skinner, Manchester, N. H.; William A. Webber, Belmont, Mass.; Frank L. Shea and William J. Miller, both of Brookline, Mass.

BROOKLINE, MASS.—The Green Brothers Mfg. Co. has been incorporated to build motor vehicles with $25,000 capital by Russell T. Green, Howard D. Green and Ralph B. Green, all of Boston.

CAMBRIDGE, MASS.—The Acme Apparatus Co. has been incorporated to make electrical apparatus and manufacturing devices with $10,000 capital by Ashley C. Zwicker, Claude F. Cairns, Belmont, Mass., and Melville Eastham.

CONCORD, MASS.—The M. D. Jones Foundry Co. has been incorporated with $25,000 capital by Loring N. Fowler, Frederick G. Jones and Charles H. Murphy, Laconia, N. H.

NATICK, MASS.—The contract has been let for a plant, 1-story, 52 x 82 feet, for the New England Pressed Steel Co.

NEW BEDFORD, MASS.—Plans are being prepared for an addition to the foundry of the Acushnet Iron Foundry.

SPRINGFIELD, MASS.—The Cheney-Bigelow Wire Works has let the contract for a 2-story, 195 x 271-foot factory addition.

SPRINGFIELD, MASS.—The Satin Mfg. Co. has been incorporated with $60,000 capital to make electrical fixtures, etc., by Isidor Satin, Jacob Magaziner and Joseph Satin.

WORCESTER, MASS.—The Worcester Wire Works, Inc., has let the contract for a 2-story, 40 x 142-foot addition to its plant, to cost about $30,000.

PAWTUCKET, R. I.—The Fales & Jenks Machine Co. will build a 1-story plant addition, 25 x 25 feet.

HARTFORD, CONN.—Plans are being made for a brick, mill construction 4-story, 50 x 120-foot office building, and a 4-story and basement, 50 x 140-foot factory for the Billings & Spencer Co.

MERIDEN, CONN.—The Miller Bros. Cutlery Co. has let the contract for a 4-story, 52 x 90-foot factory and office building extension.

NAUGATUCK, CONN.—Fire in the core department of the Naugatuck branch of the Eastern Malleable Iron Co., April 2, caused $25,000 loss.

NEW HAVEN, CONN.—The New Haven Clock Co. has let the contract for a 4-story, 40 x 48-foot factory addition.

WATERBURY, CONN.—The Waterbury Rolling Mills Co. will erect three 1-story plant additions.

WETHERSFIELD, CONN.—The Kneeland Mfg. Co. has been incorporated to make gas and electric lamps with $25,000 capital, by A. R. Steinmeyer, Hartford, Conn.; E. V. W. Kneeland, Henry Reuber Jr., and T. G. Case, Granby, Conn.

North Atlantic States

BROOKLYN, N. Y.—The Port Engineering Works, shipwright, has been incorporated with a capital of $5000 by T. Didonna, M. Cavallo and M. Solomon, 266 Humboldt street.

JOHNSON CITY, N. Y.—The Sweet Bros. Foundry Co. plans a foundry, 160 x 200 feet, to cost about $60,000.

NEW YORK.—The Maris Machine Co. has been incorporated with $25,000 capital, by A. F. Harris, S. Owen and L. H. Andrews, 233 Broadway.

NEW YORK.—The Yale Piston Ring Co., 560 West Thirty-sixth street, is planning to occupy its new plant shortly, and contemplates additional buildings.

NEW YORK.—The Eschwei Rotary Valve Motor Co. has been incorporated with $5000 capital, by H. and G. Eschwei and S. Blosveren, Glen Morris, N. Y.

NEW YORK.—Salisbury & Thomas Needle Mfg. Corp. recently was incorporated with a capital of $10,000, by B. M. Goldberger, M. Cohn and J. Teleky, 36 East Twenty-third street.

NEW YORK.—The Hercules Machine & Tool Co. has been incorporated with a capital of $100,000, by M. G. Himoff, H. J. Rosenkrans and D. Singer, 410 Broome street.

NEW YORK.—The United Mechanics Sheet Metal Works has been incorporated with $10,000 capital, by C. Halpern, S. Hornstein and S. Wurman, 503 Prospect avenue.

NEW YORK.—The Standard Mechanical Equipment Co. has been incorporated with a capital of $25,000, by W. and J. K. Evans and W. B. Connor, 90 West street.

ROCHESTER, N. Y.—The Rochester Scientific Heat Corp. has been incorporated with a capital of $30,000, by B. F. Cooper, I. Saunders and C. P. Williams.

ROCHESTER, N. Y.—The Rochester Cutlery Corp. has been incorporated with $125,000 capital, by W. H. Simmons, J. L. Wellington and S. L. Webster.

ROCHESTER, N. Y.—The Morrison Machine Products Co. has been incorporated with a capital of $100,000, by W. F. O'Donnell, G. Reisinger and L. F. Morrison.

SYRACUSE, N. Y.—The Diefendorf Gear Corp. has been incorporated with $150,000 capital, by W. H. and M. A. Diefendorf and W. F. Canough.

SYRACUSE, N. Y.—Fire at the plant of the Syracuse Alloy Steel Co., recently, did approximately $10,000 damage to the foundry. The structure was about 80 x 250 feet.

CHAMBERSBURG, PA.—The T. B. Wood's Sons Co., manufacturer of power transmission machinery, has had plans prepared for a 1-story plant addition, 40 x 80 feet.

ERIE, PA.—The Heisler Locomotive Works will build a 1-story addition to its factory here, 48 x 96 feet, to cost $10,000.

GERMANTOWN, PA.—Plans are being prepared for a power house at the plant of the Dearnley Bros. Worsted Spinning Co.

JOHNSTOWN, PA.—The Cambria Steel Co. has completed plans for a 1-story plant addition, 60 x 250 feet.

MERCER, PA.—The Simplex Mfg. Co. of Conneautville has a lease on the old plant of the Reznor Stove Co. and will fit it up for the manufacture of auto truck bodies.

NEW BRIGHTON, PA.—The Berry Metal Co. has been incorporated with $10,000, to manufacture castings, etc., by W. D. Berry, D. Lee McConaughy and others.

PENN-MARY, PA.—The Penn-Mary Coal Co., a subsidiary of the Bethlehem Steel Corp., is planning extensions to cost in excess of $500,000.

PHILADELPHIA.—The H. A. May Foundry Co.

Government Inquiries

BIDS on the following equipment are desired by the navy department, bureau of supplies and accounts:

One cutting-off machine, 5918, Newport, April 27.
Two drilling machines, 5921, Newport, April 27.
Bench lathes and bench, 5932, Washington, April 23.
One milling machine, 5934, Washington, April 23.
One toolmaker's lathe, 5935, Newport, April 23.
One pneumatic flanging machine, 5937, Newport, April 28.
Two milling machines, 5939, Newport, April 23.

Schedule numbers, places of delivery and dates of openings follow the specifications of the tools.

Kreodone EVERLASTING WOOD BLOCK FLOORS

Peerless Motor Car Co., Cleveland, Ohio

—*Actually* gives the wear that's Wanted

—and that's the reason the Peerless Motor Car Co., of Cleveland, not only once but several times, has specified Kreodone for its plant floors.

Made only of selected long-leaf yellow pine, permanently preserved by our special patented PURE creosote oil—a KREODONE floor actually does give wear proof and therefore ever-lasting service.

We make strong, exceptional claims for our floors—because there have been no failures in over 20 years of tough usage. Our customers verify this by a stream of reorders for other shops where floors have been a problem.

The secret is that Kreodone Wood Block Floors wear like steel; never decay—never bleed tar or smudge; stay where laid because they don't crack or splinter and are therefore solid and permanent.

You cannot be too exacting in your specifications for PURE creosote oil. Our experience and research for a quarter of a century is your assurance that a KREODONE floor is made right and laid right to stay right, the solution of your every floor problem.

Get the Genuine Kreodone Blocks. Watch that spelling—it means service.

Republic Creosoting Company, Indianapolis, Ind.

Plants: Indianapolis Minneapolis Mobile Seattle Norfolk

BRANCH OFFICES:

315 Peoples Gas Bldg., Chicago
206 Erie County Bank Bldg., Buffalo
152 Bay Street, Toronto, Canada
638 Old South Bldg., Boston
Berkley Ward, Norfolk
222 Society for Savings Bldg., Cleveland
834 Real Estate Trust Bldg., Philadelphia
828 Plymouth Bldg., Minneapolis
445 Central Bldg., Seattle
Masonic Temple, Mobile
211 Hammond Bldg., Detroit

has purchased property on Walnut street for a plant. Plans are being prepared.

PHILADELPHIA.—The Universal Motor Co. has awarded a contract for a 2-story service and repair works building, 75 x 215 feet, to cost $125,000.

PHILADELPHIA.—The Automotive Equipment Co. has leased a 4-story building which it will utilize for a new works.

PHILADELPHIA.—The Pennsylvania Gear & Machine Co., 435 North Broad street, has plans for a 1-story plant addition, to cost about $25,000.

PHILADELPHIA.—Plans are being prepared by the Automobile Boat Co., 407 Shubert building, for a new plant. Edward S. Napolis is president.

PHILADELPHIA.—Forty-two acres has been purchased by the Commercial Truck Co. of America, for a plant. A contract has been let to the Steele Construction Co.

PITTSBURGH.—The Liquid Carbonic Co. awarded a contract for a factory building.

PITTSBURGH.—Paul Irwin, architect, is taking bids for a machine shop for the Somerfeld Machine & Mfg. Co.

PITTSBURGH.—The Central Railway Signal Co., First National Bank building, has awarded a contract for a plant at Versailles, Pa.

PITTSBURGH.—James McSteen & Son is taking bids for a machine shop for the McKenna Brass & Mfg. Co.

PITTSBURGH.—The Pittsburgh & Shawmut railroad expects to award contracts shortly for a storehouse with offices, 40 x 140 feet.

PITTSBURGH.—The Rehl-Johnson Mfg. Co. has been organized to manufacture iron and steel specialties for marine service and to operate a general repair plant for marine work. The works will be located on Third avenue, at Block House way. The company is headed by J. L. Rehl, R. Johnson and A. J. Cox.

TITUSVILLE, PA.—The Odin Construction Co., manufacturers of boilers, tanks and stacks, is planning an addition to its plant to cost approximately $60,000. H. A. Curtis is secretary.

WILLIAMSPORT, PA.—The Williamsport Wire Rope Co. has awarded a contract for a 1-story plant addition, 100 x 340 feet.

ELIZABETH, N. J.—The Franklin Appliance Co. has been incorporated with a capital of $50,000, by C. L. Higsby, Frank and A. D. Stout, to manufacture electrical appliances.

MANVILLE, N. J.—Contracts for a 150 x 650-foot plant addition have been awarded by the H. W. Johns-Manville Co.

NEWARK, N. J.—The Klaxon Co. has temporarily abandoned its new plant project for this city.

NEWARK, N. J.—The Royal Brass Foundry Co., 39 New York avenue, has been organized by A. C. Fuchs and others.

NEWARK, N. J.—The Forged Steel Products Co. of New Jersey has been incorporated with a capital of $200,000, by John H. Gibson, Horace G. Oliver and Lionel L. Meyers.

HAGERSTOWN, MD.—This city plans to enlarge its celctric light plant.

FREDERICKSBURG, VA.—The Rappahannock Electric Light & Power Co. plans an addition, 40 x 120 feet.

FREDERICKSBURG, VA.—The Northern Neck Railway & Power Co. has been incorporated with a capital of $5,000,000 by W. H. Fowle, G. D. Happer and M. Glennon.

ROANOKE, VA.—The Walker Machine & Foundry Corp. has been organized by Charles M. Walker and others, and will erect a plant, 60 x 100 feet.

Central States Activity

HARTFORD, WIS.—Fred Jordan has leased the Hahn building and is opening a commercial machine shop, which will be equipped with new tools.

LA CROSSE, WIS.—The National Gage & Equipment Co. is erecting a 1-story machine shop addition, 135 x 253 feet, which will be equipped with automatic screw machines and other tools.

LOMIRA, WIS.—The Star Milking Machine Co., Wausau, Wis., a new $1,000,000 corporation, has leased a plant here and is installing machinery for the manufacture of automatic dairy apparatus.

MILWAUKEE.—The A. J. Lindemann & Hoverson Co., stoves and ranges, will erect a number of shop additions.

MILWAUKEE.—The John Obenberger Forge Co. has increased its capital from $250,000 to $500,000 and will enlarge its plant.

MILWAUKEE.—A plant costing $100,000 will be erected by Doelger & Kirsten for the manufacture of shears, etc. The first building will be 90 x 210 feet.

MILWAUKEE.—The Stenz Electric Co. has been incorporated with a capital of $40,000 to manufacture, repair and deal in power plant and electrical equipment. Albert A. Stenz is president.

MILWAUKEE.—Articles of incorporation have been filed by the Master Tool Makers, Inc. The company, which is capitalized at $20,000, was chartered by C. E. Blake, W. J. P. Aberg and Gladys Reynolds.

MILWAUKEE.—The American Metallic Shower Bath Co. has been incorporated with a capital of $25,000 to manufacture and deal in metal apparatus and devices. The incorporators are represented by W. M. Spooner, attorney, Trust Company building.

WAUPACA, WIS.—The Jorgenson Mfg. Co. has increased its capital from $70,000 to $350,000, and contemplates enlarging its plant. Two buildings will be erected, one equipped for brass and aluminum casting and the other for machine work.

BENTON HARBOR, MICH.—The Saranac Automatic Machine Co. will establish a paper box machinery plant here.

BUCHANAN, MICH.—The Clark Equipment Co. plans the establishment of a branch plant in Berrien Springs, Mich.

DETROIT.—The General Fire Extinguisher Co. has let contracts for a foundry.

DETROIT.—The Clayton & Lambert Co., manufacturer of auto parts, has let the steel contract for its plant at 1380 Beaubien street.

DETROIT.—Walbridge, Aldinger Co., construction engineer, has let the steel contract for the Wills-Lee Corp. plant at Marysville, Mich., to the Atlas Iron Works, Detroit.

DETROIT.—Fred C. Gilbert, 162 Virginia Park avenue, Sidney C. Love, Madison hotel, and others, have incorporated the Vulcan Motor Axle Co., with a capital of $1,000,000.

DETROIT.—Henry B. Lewis and H. S. Hall, president and vice president respectively of the Lewis-Hall Iron Works, are officers of the newly organized Steering Gear & Parts Co., Detroit.

DETROIT.—The Isko Detroit Co. has been incorporated with $30,000 capital, by E. C. McLiter, 125 Peterboro avenue, and others, to manufacture refrigerating machinery.

DETROIT.—The George N. Baker Co. has been chartered with $25,000 capital, by George N. Baker, 50 Philadelphia avenue, and others, to manufacture machinery and tools.

DETROIT.—The Saumedde Mfg. Corp. has been incorporated with $210,000 capital, by Claude Saumedde, 532 Field avenue, and others, to manufacture wire wheels and hub locks for motor cars.

DETROIT.—The Edward F. Lyon Co. has been incorporated with a capital of $60,000 to manufacture machinery, by E. F. Lyon, 110 Taylor avenue, and others.

FLINT, MICH.—The Flint Foundry Co. will build additions, 70 x 200 feet and 80 x 118 feet, to its foundry at Marshall, Mich. C. E. Boyd is manager.

FLINT, MICH.—The Armstrong Spring Co. has been incorporated with $1,500,000 capital, by R. T. Armstrong and others, to manufacture springs and metal goods.

FLINT, MICH.—Smith, Hinchman & Grylls, engineers, Washington Arcade building, Detroit, are taking bids on a 3-story machine shop for the Dort Motor Car Co.

GREENVILLE, MICH.—The Regle Brass Co. has started work on a plant to cost about $35,000.

HOLLY, MICH.—The American Spring & Mfg. Co. has established a plant here for the manufacture of coiled and flat springs.

LANSING, MICH.—Steel work has been started on the foundry for the Federal Drop Forge Co.

SAGINAW, MICH.—The new crankshaft plant of the General Motors Corp., here, to be 165 x 690 feet, will be ready for operation about May 1.

ST. JOSEPH, MICH.—The Advance Foundry Co. has been incorporated with a capital of $20,000, by William B. Mathieu and others.

PEORIA, ILL.—The Oasis Mfg. Co., manufacturer of laundry machinery, has been incorporated with a capital of $40,000.

FRANKLIN, IND.—The plant of the Hoosier Wheel Co. has been moved from Indianapolis to this city.

GARY, IND.—The Chicago Steel Wheel Co. will move its plant to this city and will be reorganized with a capital of $1,000,000.

HARTFORD CITY, IND.—The Hartford Foundry & Machine Co. has been organized by J. C. Miller, William F. Lange and L. P. Young.

INDIANAPOLIS.—The Chapman-Price Steel Co. will rebuild its plant which was recently damaged by fire.

INDIANAPOLIS.—The Olson Pneumatic Saw & Valve Co. has been incorporated with a capital of $20,000, by C. J. Charles, Richard D. Olson and others.

MUNCIE, IND.—The Indiana Metal Products Co. has been incorporated with a capital of $25,000, by E. G. Jarrell, Harry Yee and E. L. Yeo.

ROYAL CENTER, IND.—The Royal Center Engine Co. has been organized with a capital of $50,000, to engage in the manufacture of gas engines.

ALLIANCE, O.—The Stark Cabinet & Mfg. Co. recently was incorporated with a capital of $50,000, by R. M. Scranton, N. C. Fetters and others.

CANTON, O.—The plant of the American Mine Door Co. recently was damaged by fire.

CANTON, O.—The Diebold Safe & Lock Co. plans an addition to its plant at an estimated cost of $95,000.

CANTON, O.—The Frankham Brass & Bronze Co. has been incorporated with $50,000 capital, by C. L. Becker, G. Sieber and others.

CINCINNATI.—The Wiechman Pattern Co. recently was incorporated with $10,000 capital, by H. A. Wiechman, F. Wiechman and others.

CINCINNATI.—The Edna Brass Mfg. Co. contemplates a foundry addition, 45 x 50 feet, to cost $10,000.

CLEVELAND.—The Buckeye Brass Mfg. Co. is erecting an addition to its foundry.

CLEVELAND.—The Minerva Engine Co., Wicker building, plans a foundry, 100 x 120 feet.

CLEVELAND.—The Superior Tractor Co. plans a plant at an estimated cost of $125,000.

CLEVELAND.—The Lickteig Novelty Mfg. Co. has been incorporated with $10,000 capital, by J. T. Kimmel, C. A. Stevens and others.

CLEVELAND.—The Paramount Engine Valve Co. has been incorporated with a capital of $100,000, by

FARRELL-CHEEK
STEEL CASTINGS

A Personal Interest—

A thing of pride, rather than duty, is the attitude of not only the foundry For man, but of every Farrell-Cheek workman. A spirit that makes careful, skillful workmanship a voluntary service.

A thing to consider when you want castings a little better than you have ever been able to get elsewhere.

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"Makers of steel castings that are a little better than the next best."

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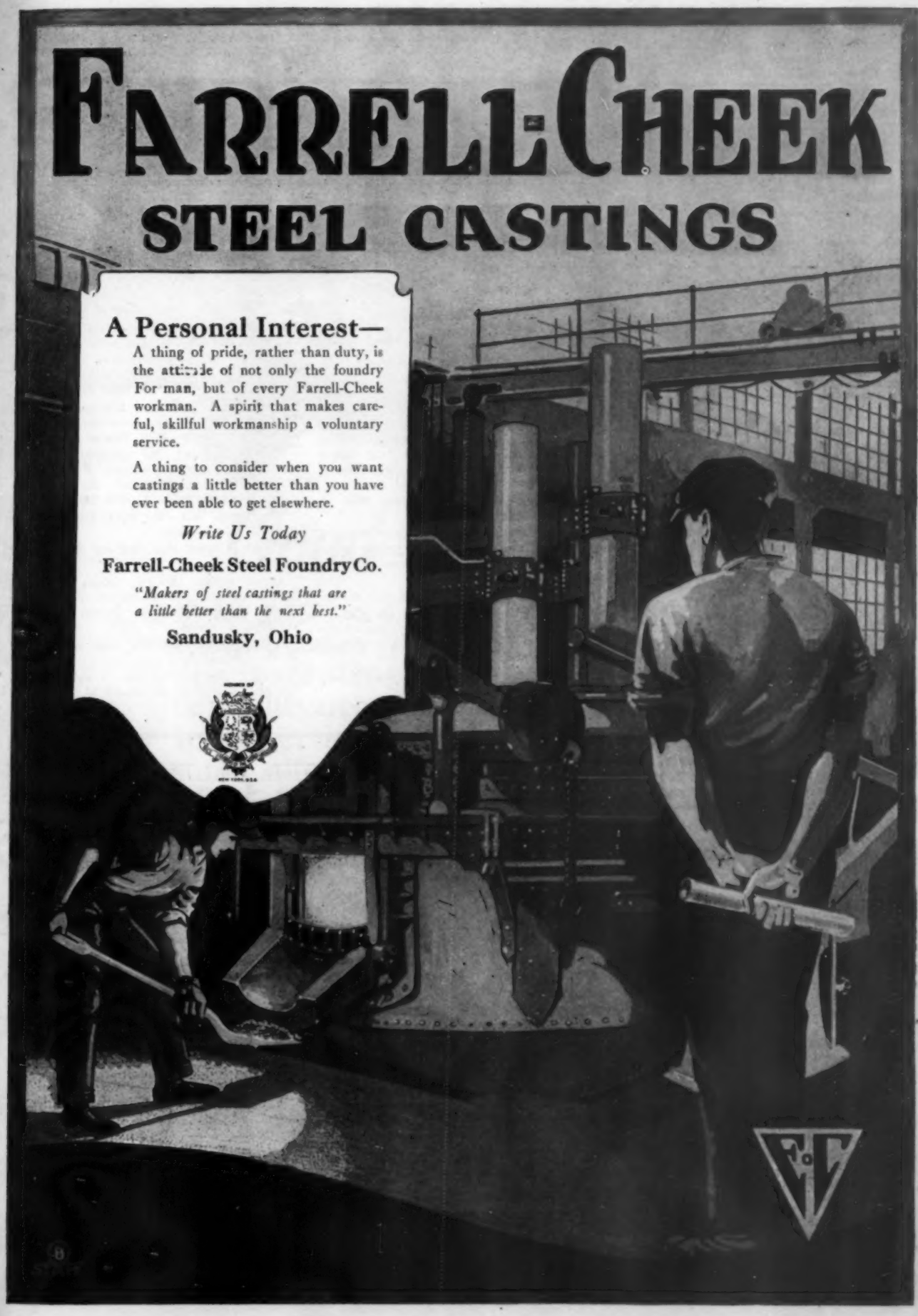

F. H. Sellberg, A. W. Thomas, R. L. Davis, M. R. Burnage and W. I. Krewson.

CLEVELAND.—The Garfield Machine Co. has been incorporated with $50,000 capital, by O. Doutt, D. Modisette and others.

CLEVELAND.—The B. & W. Tool & Die Co. recently was incorporated with $50,000 capital, by R. M. Ewing, J. L. Lind and others.

CLEVELAND.—The Globe Erecting & Reinforcing Co. recently was incorporated with $5000 capital, by A. Goldman, G. W. Poppleton and others.

COLUMBUS, O.—The Central Ohio Iron & Steel Co. has been incorporated with a capital of $25,000, by B. F. Silberstein, L. Silberstein, L. W. Barron, Z. Goldstein and C. Silberstein.

DAVENPORT, IOWA.—John Seller & Son have started work on a structural shop for the Davenport Machine & Foundry Co.

DAYTON, O.—The H. Schriber Sheet Metal Co. has been incorporated with $10,000 capital, by H. Schriber, O. J. Rupp and others.

DAYTON, O.—A safety device will be manufactured by the Wiesman Mfg. Co., 14 North Canal street, which was recently incorporated with $25,000 capital, by W. A. Wiesman and J. F. Stempler.

DAYTON, O.—The Master Electric Co. has been incorporated by E. P. Larsh, S. A. Brown, A. C. Jackson, R. O. Corwin and John H. Larsh, with $50,000 capital, to manufacture small motors.

DOVER, O.—The Dover Mfg. Co. plans a plant addition, 3-stories, 80 x 200 feet, to cost $200,000.

ELMORE, O.—The Multiple Concrete Machine Co. will erect an addition, 40 x 60 feet.

FOSTORIA, O.—The Globe Body Co. contemplates an addition to its plant, 50 x 50 feet.

LISBON, O.—The Wright Mfg. Co., manufacturer of twist drills, has a site on which it plans a new plant.

MARYSVILLE, O.—Work has started on a new building at the plant of the Regent Brass Foundry Co.

NEW PHILADELPHIA, O.—The Phelps Can Co. will remodel a vacant building here into a plant for the manufacture of canes, etc. M. J. Phelps is president of the company.

SANDUSKY, O.—The Sandusky Foundry & Machine Co. has been incorporated with $30,000 capital, by F. S. Whitcomb, C. Crawford and others.

TOLEDO, O.—The International Oxygen Co., 2102 Auburn avenue, plans a plant.

TOLEDO, O.—The Locomotive Appliance Co. recently was incorporated with a capital of $25,000, by E. H. Ray, E. M. Gingry and others.

WARREN, O.—The General Fire Extinguisher Co. is having plans prepared for a foundry, 150 x 280 feet.

WASHINGTON COURTHOUSE, O.—The Washington Metal Products Co. has been incorporated with $50,000 capital, by J. D. Boone, P. S. Horton, E. R. Bales and others.

WAUSEON, O.—The Automotive Body Co. recently was chartered with $50,000 capital, by C. A. Culbert, S. J. Ryan, J. Trethewey and others.

YOUNGSTOWN, O.—The Automatic Oil Burner Co. has been incorporated with $50,000 capital, by N. L. Norris, F. E. Norris and others.

CHARLESTON, W. VA.—The Kanawha Mfg. Co. will rebuild its plant recently damaged by fire.

CHARLESTON, W. VA.—The Griffith-Foster-Rodes Co. has been incorporated with $10,000 capital, to engage in sheet metal working, by G. M. Griffith, W. A. Foster and F. S. Rodes.

CLARKSBURG, W. VA.—The Clarksburg Welding & Brazing Co. will erect a machine shop.

DUNBAR, W. VA.—The Fletcher Bros. Enamel Co. is planning for a plant for the manufacture of aluminum ware.

PARKERSBURG, W. VA.—The Union Insulating Co. has completed plans for a plant, 80 x 216 feet, to cost $100,000.

WHEELING, W. VA.—Contract for an addition to the plant of the Globe Automatic Sprinkler Co. to cost about $115,000 has been awarded to the Austin Co., Cleveland.

In The South

LOUISVILLE, KY.—Amended articles of incorporation have been filed by the Ulmer Circuit Breaker Co., manufacturer of electrical equipment, increasing its capital to $100,000. Plans are being prepared for enlarged operations.

LOUISVILLE, KY.—Articles of incorporation have been filed by the John H. Isert Co. with a capital of $20,000, to engage in the manufacture of sheet metal products. The incorporators are John H. and Mary L. Isert and Truman Cooke.

MAYSVILLE, KY.—H. M. Williams, Cleveland, has been in this city inspecting a site for a foundry and iron works to be operated as a branch of a large Cleveland house.

MORTONS GAP, KY.—N. E. Stone & Co., Madisonville, Ky., have a contract for a coal mining plant for the Hamblett-Mining Co., of which C. B. Thothen is secretary-treasurer. Pumps and other equipment will be installed.

OWENSBORO, KY.—The Scientific Steel Wool Co. is reported planning a plant.

ST. MATTHEWS, KY.—The Kentucky Switch & Signal Co. has been incorporated with $16,000 capital, by R. V. Cheatham, Richard R. Scroggan and W. E. Scroggan.

WHITESBURG, KY.—The Whitesburg Light & Power Co. contemplates improving its plant.

ASHEVILLE, N. C.—The National Needle Co. has been incorporated with $50,000 capital, by E. I. Clancy, O. R. Jarrett and George R. Rose.

CHERRYVILLE, N. C.—The Cherryville Foundry Works plans an addition to its plant.

ANDERSON, S. C.—John T. Burriss & Sons, metal shingles, will erect an addition, 30 x 110 feet.

UNION, S. C.—The General Repair & Machinery Co. has been incorporated with $3000 capital, by A. C. Osteen, W. M. Withers and others.

REYNOLDS, GA.—This city contemplates an electric lighting plant at an estimated cost of $35,000.

BIRMINGHAM, ALA.—The Stockham Pipe & Fittings Co. will improve its plant by two buildings.

BIRMINGHAM, ALA.—The Floatless Carburetor Co. has been incorporated with $1000 capital, by H. M. Smith, G. G. W. Hoover and Noble Richardson.

BIRMINGHAM, ALA.—The Birmingham Pipe & Fittings Co. has been incorporated with $2000 capital, by K. A. Conville, R. H. Wharton and others.

CASTLEBERRY, ALA.—The Castleberry Utilities Co. has been incorporated with a capital of $20,000 and will build an electric light plant. The incorporators are G. G. Kramp, Robert A. Baird and others.

TUSCALOOSA, ALA.—The Marion Foundry & Machine Co. plans a foundry.

WINTER GARDEN, FLA.—This city plans to erect an electric lighting plant.

BATON ROUGE, LA.—The Istrouma Foundry & Machine Co. has been incorporated with $10,000 capital, by James F. Carroll, William F. Bonifay and James A. Durand.

COLUMBIA, LA.—This city plans to install an electric light and water plant.

MONROE, LA.—This city plans to rebuild its electric light plant which was damaged by fire.

Business in Canada

LOUISBURG, N. S.—The British Syndicate which proposes to erect a dry dock here, to cost $5,000,000 is applying to the Government for permission to start construction work. Representatives, F. T. Green, 50 Bold street, Warrington, England. Engineer, R. H. Cooper, Sydney, N. S.

HULL, QUE.—The Hull Iron & Steel Works is having plans prepared for a foundry, etc., here.

MONTREAL, QUE.—J. L. M. Lemieux has opened the Modern Machine Works at 83 Bleury street, and will carry on a general machine shop for construction and repair work.

MONTREAL, QUE.—The Dominion Welding Mfg. Co., 584 St. Timothee street, has acquired the plant of the Belanger Foundry Co., at 340 Amherst street, and will occupy the premises immediately.

MONTREAL, QUE.—The Marchand Electrical Works, Ltd., has been chartered to manufacture motors, dynamos, electrical machinery, appliances, etc., with $50,000 capital, by Ulric A. LeDuc, Joseph A. Robillard, Joseph E. Lamothe and others.

MONTREAL, QUE.—The Bearing Metals, Ltd., has been incorporated to manufacture machinery, tools, etc., with $50,000 capital, by Ernest L. W. Saunderson, Norman McL. Campbell, Aime S. Bruneau and others.

MONTREAL, QUE.—Hans Renold of Canada, Ltd., has been incorporated to manufacture hardware, tools, etc., with $25,000 capital, by William H. Jackson, Manchester, England; Herbert George, Montreal; John M. Clark, 156 Yonge street, Toronto, Ont., and others.

MONTREAL, QUE.—The British Empire Steel Corp. has been incorporated to carry on business as ironmasters, steelmakers and converters, coke manufacturers, and to manufacture castings, etc., with $100,000 capital, by Frederick H. Markey, Waldo W. Skinner, George G. Hyde and others.

ST. HYACINTHE, QUE.—The Omega Machinery, Ltd., has been incorporated to manufacture windmills, towers, pumps, anvils, machinery, tools, iron, steel, castings, etc., with $200,000 capital, by Joseph L. Champagne, Joseph E. Lussier, Eugene E. Gamache and others.

BRANTFORD, ONT.—Robbins & Myers Co., Morrell street, have awarded contracts for a factory to cost $150,000.

BRANTFORD, ONT.—The Crown Electric Mfg. Co., 17 Pearl street, has let the contract for a factory addition to cost $15,000.

BRANTFORD, ONT.—Richard Hart has a permit for a brass foundry at 22 Leonard street, to be 20 x 36 feet.

CHATHAM, ONT.—The Oliver Chilled Plow Co., South Bend, Ind., plans a plant in Western Ontario, in connection with which negotiations are not yet closed.

4810 AIR HOSE

Good Air Hose

must possess a cover of the necessary toughness, a tube that will resist the disintegrating action of oil, and the flexibility necessary to prevent kinking. Its cover is built to more than withstand all the punishment to which air hose is subjected. Its tube is made of the best oil-resisting compound yet developed. It is the most flexible when new, and will remain flexible longer than any other pneumatic hose made.

Prove the worth of 4810 by installing several lengths on your work.

United States Rubber Company

The World's Largest and Most Experienced Manufacturer of Mechanical Rubber Goods

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HEAVY MELTING STEEL

Pittsburgh	$26.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	24.00 to 24.50
Cleveland	24.00 to 24.50
St. Louis	23.00 to 23.50
Buffalo	25.00 to 25.50
New York (dealers)	20.00 to 21.00
Birmingham	24.00 to 25.00
Cincinnati	24.50 to 25.00
Valleys	25.25 to 25.50
Boston (dealers)	20.00 to 21.00
Detroit	22.00 to 22.50

BUNDLED SHEETS

Pittsburgh	$15.50 to 16.00
Eastern Pennsylvania	19.50 to 20.50
Cleveland	14.50 to 15.00
Buffalo	17.00 to 18.00
Cincinnati	18.00 to 19.00
St. Louis	14.00 to 14.50

STEEL RAILS, SHORT

Chicago	$28.50 to 29.00
Boston (dealers)	21.00 to 22.00
Cleveland	22.00 to 22.50
St. Louis	26.00 to 26.50
Birmingham	24.00 to 25.00
Cincinnati	24.00 to 25.00

STOVE PLATE

Pittsburgh	$29.00 to 30.00
Chicago	34.00 to 34.50
Eastern Pennsylvania	29.00 to 30.00
Cleveland	30.00 to 31.00
Detroit	31.00 to 31.50
St. Louis	32.00 to 32.50
Buffalo	32.00 to 33.00
New York	30.00 to 31.00
Birmingham	29.00 to 30.00
Cincinnati	28.00 to 28.50
Boston	26.00 to 27.00

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$30.00 to 31.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	31.00 to 32.00
Buffalo	32.00 to 33.00

SHOVELING STEEL

Chicago	$23.00 to 23.50
St. Louis	22.00 to 22.50

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$26.00 to 27.00
Chicago	26.00 to 26.50
St. Louis	26.50 to 27.00

BALED SHEETS

Pittsburgh	$21.00 to 22.00
Chicago	20.50 to 21.00
Detroit	19.00 to 19.50

FROGS, SWITCHES, GUARDS

Chicago	$23.50 to 24.00
St. Louis	24.00 to 24.50
Eastern Pennsylvania	24.00 to 24.50

BOILER PLATE, CUT

Chicago, No. 1	$19.50 to 20.00
St. Louis	17.00 to 17.50

ANGLE BARS—STEEL

Chicago	$26.00 to 27.00
St. Louis	24.00 to 25.00

Iron Mill Scrap

RAILROAD WROUGHT

Pittsburgh, No. 1	$31.00 to 32.00
Pittsburgh, No. 2	25.00 to 26.00
Chicago, No. 1	30.25 to 30.75
Chicago, No. 2	27.50 to 28.00
Eastern Pennsylvania No. 1	35.00 to 36.00
Cleveland, No. 1	29.00 to 29.50
St. Louis, No. 1	28.50 to 29.00
St. Louis, No. 2	26.50 to 27.00
Buffalo	31.00 to 32.00
Cincinnati	29.00
Birmingham, No. 1	23.00 to 24.00
New York, No. 1 (dealers)	32.50 to 33.50
Boston (dealers)	29.50 to 30.50

WROUGHT PIPE

Eastern Pennsylvania	$24.50 to 25.00
Buffalo	21.00 to 22.00
New York (dealers)	21.50 to 22.00
Boston (dealers)	19.00 to 20.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$29.00 to 30.00

CITY WROUGHT

New York, long (dealers)	$26.00 to 27.00

BUSHELING

Chicago, No. 1	$23.00 to 23.50
Chicago, No. 2	16.50 to 17.00
Cleveland, No. 1	18.75 to 19.25
Cleveland, No. 2	16.00 to 16.25
St. Louis, No. 1	22.50 to 23.00
Buffalo, No. 1	20.00 to 21.00
Cincinnati, No. 1	20.50 to 21.50
Eastern Pennsylvania, No. 1	19.00 to 20.00

MACHINE SHOP TURNINGS

Pittsburgh	$16.00 to 16.50
Chicago	14.50 to 15.00
Eastern Pennsylvania	19.00 to 20.00
Cleveland	14.50 to 15.00
Buffalo	16.50 to 17.00
New York (dealers)	16.50 to 17.00
St. Louis	15.00 to 15.50
Detroit	14.00 to 14.50
Cincinnati	14.00 to 14.50
Birmingham	15.00 to 17.00
Valleys	16.00 to 16.50
Boston (dealers)	15.00 to 16.00

CAST IRON BORINGS

Pittsburgh	$19.50 to 20.00
Chicago	15.00 to 15.50
Eastern Pennsylvania	20.00 to 21.00
Eastern Pennsylvania (chemical)	24.00 to 25.00
Cleveland	17.00 to 17.50
St. Louis	16.00 to 16.50
Detroit	16.50 to 17.00
Buffalo	17.00 to 18.00
New York (dealers' price)	17.00 to 17.50
Cincinnati	15.00 to 16.00
Birmingham	15.00 to 16.00
Valleys	18.75 to 19.00
Boston (dealers)	15.00 to 16.00

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Eastern Pennsylvania	$17.50 to 18.50
Boston (dealers)	14.00 to 15.00

IRON AXLES

Pittsburgh	$45.00 to 46.00
New York (dealers)	46.00 to 47.00
Chicago	44.50 to 45.00
Eastern Pennsylvania	45.00 to 46.00
Detroit	41.00 to 42.00
Cleveland	42.50 to 43.00
St. Louis	44.00 to 44.50
Buffalo	40.00
Cincinnati	36.00 to 37.00
Birmingham	30.00 to 31.00

IRON RAILS

Chicago	$33.50 to 34.00
Cleveland	29.50 to 30.50
St. Louis	33.00 to 33.50
Buffalo	28.00 to 29.00
Cincinnati	26.00 to 27.00

PIPES AND FLUES

Chicago	$19.50 to 20.00
Cleveland	20.00 to 20.50
St. Louis	20.00 to 20.50
Cincinnati	21.00 to 21.50

GRATE BARS

Chicago	$34.00 to 34.50
Cleveland	30.00 to 31.00
Detroit	22.50 to 23.50
Buffalo	24.00 to 25.00
New York	26.00 to 27.00
Eastern Pennsylvania	30.00 to 31.00

FORGE FLASHINGS

Cleveland, large	$17.25 to 17.50
Chicago, small	19.50 to 20.00
Cleveland, small	18.25 to 18.50
Boston (dealers)	15.00 to 16.00

FORGE SCRAP

Chicago	$27.50 to 28.00
Eastern Pennsylvania, No. 1	19.50 to 20.50
Boston	14.50 to 15.00

ARCH BARS AND TRANSOMS

Chicago	$35.50 to 36.00
St. Louis	34.00 to 34.50

ANGLE BARS—IRON

Chicago	$35.50 to 36.00
St. Louis	33.00 to 33.50

Iron and Steel Works Scrap

AXLE TURNINGS

Pittsburgh	$21.50 to 22.00
Eastern Pennsylvania	21.00 to 22.00
Boston (dealers)	16.50 to 17.50
St. Louis	16.50 to 17.00
Detroit	$16.50 to 17.00
Cleveland	20.00 to 20.50
Buffalo	20.00 to 21.00
Chicago	20.50 to 21.00

STEEL CAR AXLES

Pittsburgh	$35.00 to 36.00
Eastern Pennsylvania	35.00 to 36.00
Cleveland	33.00 to 34.00
St. Louis	37.50 to 38.00
Buffalo	40.00
Chicago	37.50 to 38.00
New York (dealers)	39.00 to 40.00
Birmingham	31.00 to 32.00
Boston (dealers)	28.00 to 29.00
Detroit	32.50 to 33.00

SHAFTING

Eastern Pennsylvania	$35.00 to 37.00
St. Louis	33.50 to 34.00
New York (dealers)	31.00 to 32.00
Chicago	36.50 to 37.00

Iron Foundry Scrap

CAR WHEELS

Pittsburgh, iron	$39.00 to 40.00
Pittsburgh, steel	26.00 to 27.00
Chicago, iron	38.50 to 39.00
Eastern Pennsylvania, iron	39.00 to 41.00
Cleveland, iron	33.50 to 34.50
St. Louis, iron	35.50 to 36.00
Buffalo, iron	41.00 to 42.00
Birmingham, iron	29.00 to 30.00
Birmingham, tram car	30.00 to 31.00
Boston	34.00 to 35.00
Cincinnati	30.00 to 31.00
New York, iron	36.00 to 37.00
Detroit	31.00 to 31.50

NO. 1 CAST SCRAP

Pittsburgh, cupola	$39.00 to 40.00
Chicago, cupola	42.25 to 42.75
Eastern Pennsylvania, cupola	38.00 to 40.00
Cleveland, cupola	39.00 to 40.00
New York, cupola (dealers)	38.00 to 39.00
Cincinnati, No. 1, machinery, cupola (net)	34.00 to 35.00
Detroit	34.00 to 34.50
Birmingham, cupola	30.00 to 31.00
St. Louis, railroad	40.00 to 40.50
St. Louis, agricultural	39.00 to 39.50
Buffalo	37.00 to 38.00
Boston	43.00 to 44.00
Valleys	38.00 to 39.00

HEAVY CAST

New York (dealers)	$35.50 to 36.50
Buffalo	27.00 to 28.00
Pittsburgh	31.00 to 32.00
Cleveland	28.00 to 28.50
Boston	36.00 to 37.00

MALLEABLE

Pittsburgh, railroad	$30.00 to 31.00
Pittsburgh, agricultural	27.00 to 28.00
Chicago, railroad	31.00 to 31.50
Chicago, agricultural	30.50 to 31.00
Eastern Pennsylvania, railroad	28.00 to 29.00
Cleveland railroad	31.50 to 32.00
Cleveland, agricultural	26.50 to 27.00
St. Louis, railroad	28.00 to 28.50
St. Louis, agricultural	27.00 to 27.50
Cincinnati, railroad	29.00
Cincinnati, agricultural	28.00 to 29.00
Boston, railroad	27.50 to 28.50
Buffalo	31.00 to 32.00

Miscellaneous Scrap

REROLLING RAILS
5 feet and over

Pittsburgh district	$32.00 to 33.00
Chicago	32.50 to 33.00
Eastern Pennsylvania	31.00 to 33.00
Cleveland	31.00 to 31.50
St. Louis	31.50 to 32.00
Birmingham	31.00 to 32.00
Boston (dealers)	30.00 to 30.50
Detroit	29.00 to 30.00

LOCOMOTIVE TIRES

Chicago	$27.50 to 28.00
St. Louis	25.50 to 26.00

BOILER PUNCHINGS

Chicago	$30.00 to 30.50
Eastern Pennsylvania	29.00 to 31.00

For Sale

3000 Tons 6" Shell Forgings, located in Chicago district.

Will be pleased to receive your inquiry for price if you are interested.

See us
Concerning Your
Requirements
And our
Prices.

MILLCO
SERVICE

Sell
Carloads
Right
And be
Pleased.

The James. S. Miller Company
McCormick Bldg Chicago.

Business Changes Recently Announced By the Trade

AS OUTLINED on page 524 THE IRON TRADE REVIEW, Aug. 21, 1919, the Chicago Pneumatic Tool Co., has removed its general headquarters to the Chicago Pneumatic building, 6 East Forty-fourth street, New York City. The company maintains branches in 26 important cities of the country, at 17 of which, service stations are operated to repair tools.

The company's Chicago district sales branch, previously in the Fisher building, has been removed to new quarters at 300 North Michigan boulevard. Its Chicago service branch, formerly at 521 South Dearborn street, has been consolidated with the sales branch at the new address. J. L. Canby is district manager.

* * *

The Moline Forging Co., Moline, Ill., has changed its name to Moline Forge.

* * *

The name of the Bleveney Machine Co., Boston and Newark, N. J., has been changed to the Production Machine Co.

* * *

The Kirchen Machine Co., Lansing, Mich., manufacturer of tools, jigs and dies, has moved to 117 South Grand avenue.

* * *

The Inter-American Engineering Corp., Bridgeport, Conn., has changed its name to the Engineers Corp.

* * *

The Louisville Pattern Works, Louisville, Ky., has changed its name to the Louisville Pattern & Engineering Corp.

* * *

The name of the Keystone Bronze Foundry Co., Pittsburgh, has been changed to the United Bronze of Pittsburgh.

* * *

The Hyatt Roller Bearing Co. has removed its New York headquarters to Sixth avenue at Forty-first street.

* * *

The American Coal & Coke Co., Knoxville, Tenn., has amended its charter changing its name to the American Coal, Coke & Iron Co.

* * *

The Arnold Tool Co., Dayton, O., will remove from Main and Apple streets to Edgewood avenue, corner of Middle street

* * *

The Titusville Forge Co., Titusville, Pa., announces the opening of a branch office in the L. C. Smith building, Seattle, Wash.

* * *

The Chambers Valve Co. has removed its office from 30 Church street, New York, to room No. 1017, 23 West Forty-third street.

* * *

The Vulcan Iron & Steel Co., a West Virginia corporation, has filed notice in Pennsylvania of change of name to the Monongahela Iron & Steel Co.

* * *

The Union Electric Steel Co. has moved its general offices from the Keystone bank building, Pittsburgh, to its works at Carnegie, Pa.

* * *

The Maher Engineering Co., Chicago, has opened a branch office in charge of Lincoln D. Maher at 708 Schofield building, Cleveland.

* * *

The Tacony Steel Co., Philadelphia, has opened offices in the Marquette building, Chicago Frank B. Hillwock being district sales manager.

* * *

The Emery Steel Castings Co. 605 Continental building, Baltimore, has been incorporated to succeed the Emery Steel Co., 210 North Garrison lane, that city.

* * *

The Titusville Forge Co., Titusville, Pa., has established district offices in the Commercial Trust building, Springfield, Mass., and in the Union League building, Los Angeles.

* * *

Western, Manning, Maxwell & Moore, Inc., subsidiary company of Manning, Maxwell & Moore, Inc., New York, has removed to 40-42 Fremont street, San Francisco.

* * *

The Thomas Spacing Machine Co., Fulton building, Pittsburgh, has opened a branch office at 57 Transportation building, Philadelphia, in charge of G. L. Bohannon.

* * *

The Pittsburgh office of F. R Phillips & Sons Co., Philadelphia, which temporarily has been located in the William Penn hotel, Pittsburgh, now is in permanent quarters in room 209, Bessemer building.

* * *

The Consolidated Steel Corp., New York, is opening an office in Shanghai, in charge of Gilbert L. Robinson and Charles E. Masters. This gives this steel exporter direct representation in India, Australia, New Zealand, Africa, South America, Europe and China.

* * *

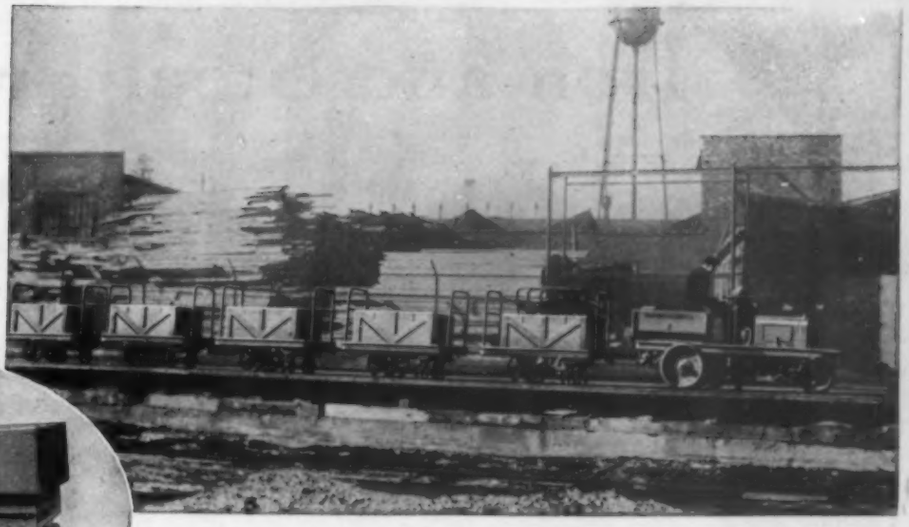
The Homestead Valve Mfg. Co., Inc., Pittsburgh, with plant at Homestead, Pa., has removed its New York offices to larger quarters at 242 Lafayette street. This office is in charge of P. L. Rhodes, assisted by William Gormly, John Gormly, George Nagle, C. A. Tyler and W. B. Gpering.

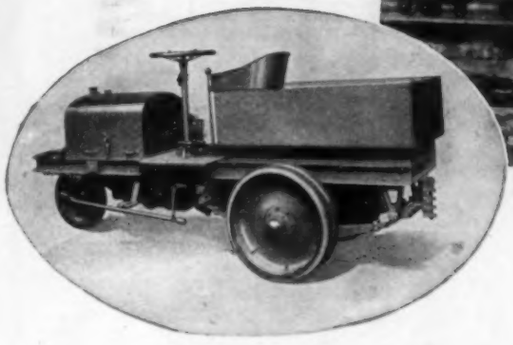
* * *

Alfred Herbert, Ltd., 54 Dey street, New York, has opened an office in Toronto, Ont., in the Board of Trade building, 31 Yonge street, for the sale of machine tools, small tools, steel, etc., to the Canadian trade. J. C. Blair, G. A. Keith and others are in charge.

* * *

Atkinson & Utech, Inc., 111 Broadway, New York, district sales agent for the Titusville Forge Co., Titusville, Pa., has opened a branch office at 403 Commercial Trust building, Springfield, Mass., in charge of Harry T Calkins, well known throughout New England and the forging industry.





Built to Save Trucking Labor in Industrial Plants

Here are some of the Duties Performed by Tructractors:

Hauls raw materials, castings, coal, foundry sand—whatever needs to be hauled in the foundry.

In the factory the Tructractor distributes materials to proper departments—directly to machines—as much as 10 tons in one trip at any speed to 12 miles per hour.

Keeps supplies and parts moving from one building or department to another, through *yards, aisles and doorways*—spots its load exactly in desired place.

EVERY industrial plant is installing labor-saving machinery—to speed production and lower costs.

The new labor-saver and cost-cutter is the *Clark Tructractor.*

With it, one man does the trucking and haulage of many. It is specially designed for industrial haulage. Compact, sturdy, gasoline driven, it will tow as much as ten tons on trailers, and carry 2,500 pounds in the body.

The Clark Tructractor works constantly—24 hours a day if necessary—requires no special mechanic to run, and operates at low cost.

The Tructractor travels at any speed between ¼ and 12 miles per hour in the plant and yard.

A transportation expert will be sent to study your handling problems without obligation to you. A well-illustrated booklet shows the many tasks performed by Tructractors. Write for your copy and Transportation Analysis Sheet.

CLARK TRUCTRACTOR COMPANY
1134 Michigan Avenue, Chicago

CLARK TRUCTRACTOR

Iron and Steel Prices

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron	$7.45
Mesabi Bessemer, 55 per cent iron	7.20
Old range nonbessemer, 51½ per cent iron	6.70
Mesabi nonbessemer, 51½ per cent iron	6.55

Port Henry Iron Ore, f.o.b. Port Henry

Old bed 21 furnace	$5.80
Old bed concentrates, 63 per cent	6.70
Harmony, cobbed, 63 per cent	6.70
New bed, low phos., 65 per cent	9.50
Lump ore for fix	7.00

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 65c to 75c per unit, nominal.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 65c to 80c per unit.

Caucasian, 48 to 50 per cent, f.o.b. cars, Atlantic ports, 60c to 65c per unit, nominal.

Warehouse Prices

Steel bars, Boston	5.00c
Steel bars, Chicago	3.37c to 3.87c
Steel bars, Cleveland	3.27c to 6.00c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	5.00c
Steel bars, New York	3.37c to 4.75c
Steel bars, St. Louis	3.94c to 4.50c
Steel bars, Cincinnati	4.50c
Steel bars, St. Paul	3.59c to 4.095c
Steel bars, Buffalo	4.50c
Iron bars, Boston	5.00c
Iron bars, Buffalo	5.26c
Iron bars, Chicago	3.87c to 4.50c
Iron bars, Detroit	4.085c
Iron bars, St. Louis	4.32c to 4.50c
Iron bars, Cincinnati	4.50c
Iron bars, Philadelphia	5.00c
Iron bars, New York	4.25c to 4.50c
Shapes, Chicago	3.47c to 3.97c
Shapes, Detroit	3.935c
Shapes, Boston	5.00c
Shapes, St. Louis	4.04c
Shapes, St. Paul	3.695c to 4.195c
Shapes, New York	3.47c to 4.75c
Shapes, Cleveland	3.37c to 5.50c
Shapes, Philadelphia	4.50c
Shapes, Phila., 2-inch and smaller	5.00c
Shapes, Buffalo	4.41c
Shapes, Cincinnati	4.10c to 4.25c
Plates, Buffalo	4.61c
Plates, Chicago	3.67c to 4.17c
Plates, Detroit	4.135c
Plates, Boston	5.55c
Plates, St. Louis	3.74c to 4.24c
Plates, St. Paul	3.895c to 4.395c
Plates, New York	3.67c to 5.00c
Plates, Cleveland	3.57c to 5.50c
Plates, Phila., ¼-inch and heavier	5.50c
Plates, Phila., ⅜-inch	6.00c
Plates, Cincinnati	5.25c
No. 10 blue anl. sheets, N. Y.	6.12c to 7.00c
No. 10 blue anl. sheets, Phila.	7.00c
No. 10 blue anl. sheets, Chicago	4.57c to 6.52c
No. 10 blue anl. sheets, Cleveland	6.75c to 7.35c
No. 10 blue anl. sheets, Boston	6.55c
No. 10 blue anl. sheets, Buffalo	6.51c
No. 10 blue anl. sheets, St. L.	6.50c to 6.59c
No. 10 blue anl. sheets, Cincinnati	6.00c
No. 10 blue anl. sheets, St. Paul	4.79c to 6.245c
No. 10 blue anl. sheets, Detroit	5.485c
No. 28 black sheets, Chicago	5.62c to 7.50c
No. 28 black sheets, New York	8.00c to 8.75c
No. 28 black sheets, Phila.	8.00c
No. 28 black sheets, Cleveland	6.75c to 8.15c
No. 28 black sheets, Boston	8.65c
No. 28 black sheets, Cincinnati	8.50c to 9.00c
No. 28 black sheets, Detroit	6.75c
No. 28 black sheets, St. Louis	8.00c
No. 28 black sheets, St. Paul	5.845c to 7.225c
No. 28 black sheets, Buffalo	8.25c
No. 28 galv. sheets, Chicago	6.97c to 9.00c
No. 28 galv. sheets, New York	9.25 to 10.00c
No. 28 galv. sheets, Phila.	10.00c to 10.50c
No. 28 galv. sheets, Boston	10.00c
No. 28 galv. sheets, Cleveland	9.00c to 9.50c
No. 28 galv. sheets, Cincinnati	8.75c to 9.00c
No. 28 galv. sheets, Detroit	8.25c
No. 28 galv. sheets, Buffalo	9.50c
No. 28 galv. sheets, St. Louis	10.00c
Bands, New York	4.07c to 6.00c
Bands, Boston	6.75c
Bands, Detroit	4.78c
Bands, Buffalo	5.76c
Hoops, Buffalo	6.01c
Hoops, Boston	7.25c
Hoops, New York	6.07c
Hoops, Detroit	5.035c
Cold rolled shafting, Buffalo	6.00c
Cold rolled shafting, New York	6.00c to 7.50c
Cold rolled shafting, Boston	6.50c
Cold rolled flats, squares and hexagons, New York	6.50c to 7.50c
Cold rolled rounds	6.00c

Mill Sheet Schedule

BLACK

Differentials for gage, per 100 pounds

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:	
Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70
Buffalo to:	
Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90
Virginia furnaces to:	
Philadelphia	4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40
Birmingham, Ala., to:	
Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	$4.30
Chicago to:	
Des Moines	3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90
Ironton and Jackson, O., to:	
Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	25.0 cents
Boston	30.0 cents
Buffalo	21.0 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

GALVANIZED AND LONG TERNE

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	+15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

BLUE ANNEALED

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Pittsburgh basing discounts to jobbers in carloads

Steel Pipe

STANDARD WEIGHT

	Black	Galvanized
Butt Weld		
⅛, ¼ and ⅜-inch	47 to 50½	20½ to 24
½-inch	51 to 54½	36½ to 40
¾ to 3-inch	54 to 57½	40½ to 44
Lap Weld		
2-inch	47 to 50½	34½ to 38
2½ to 6-inch	50 to 53½	37½ to 41
7 to 12-inch	47 to 50½	33½ to37
13 to 14-inch	37½ to 41	
15-inch	35 to 38½	

PLUGGED AND REAMED

Butt Weld		
1 to 3-inch	52 to 55½	38½ to 42
3½-inch	45 to 48½	32½ to 36
Lap Weld		
2½ to 6-inch	48 to 51½	35½ to 39

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼ and ⅜-inch	43 to 46½	25½ to 29
½-inch	48 to 51½	35½ to 39
¾ to 1½-inch	52 to 55½	39½ to 43
2 to 3-inch	53 to 56½	40½ to 44
Lap Weld		
2-inch	45 to 48½	33½ to 37
2½ to 4-inch	48 to 51½	36½ to 40
4½ to 6-inch	47 to 50½	35½ to 39
7 to 8-inch	43 to 46½	29½ to 33
9 to 12-inch	38 to 41½	24½ to 28

DOUBLE EXTRA STRONG PLAIN

Butt Weld		
½-inch	39 to 42½	28½ to 32
¾ to 1½-inch	42 to 45½	31½ to 35
2 to 2½-inch	44 to 47½	33½ to 37
Lap Weld		
2-inch	37 to 40½	27½ to 31
2½ to 4-inch	39 to 42½	29½ to 33
4½ to 6-inch	38 to 41½	28½ to 32
7 to 8-inch	33 to 36½	19½ to 23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

	Black	Galv.
Butt Weld		
⅛-inch	+ 8	+36
¼-inch	17½	+11½
⅜-inch	21½	1½
½ to 1½-inch	26½	8½
Lap Weld		
2-inch	20½	4½
2½ to 6-inch	22½	7½
7 to 12-inch	17½	2½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛-inch	+21	+62
¼-inch	10½	+14½
⅜-inch	15½	+ 9½
½ to 1½-inch	21½	+ 3½
Lap Weld		
2-inch	16½	+ 8½
2½ to 4-inch	18½	+ 6½
4½ to 6-inch	17½	+ 7½
7 and 8-inch	....	....
9 and 12-inch	2½	+22½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld		
½-inch	+ ½	+16½
¾ to 1½-inch	4½	+11½
Lap Weld		
2-inch	½	+15½
2½ to 4-inch	2½	+13½